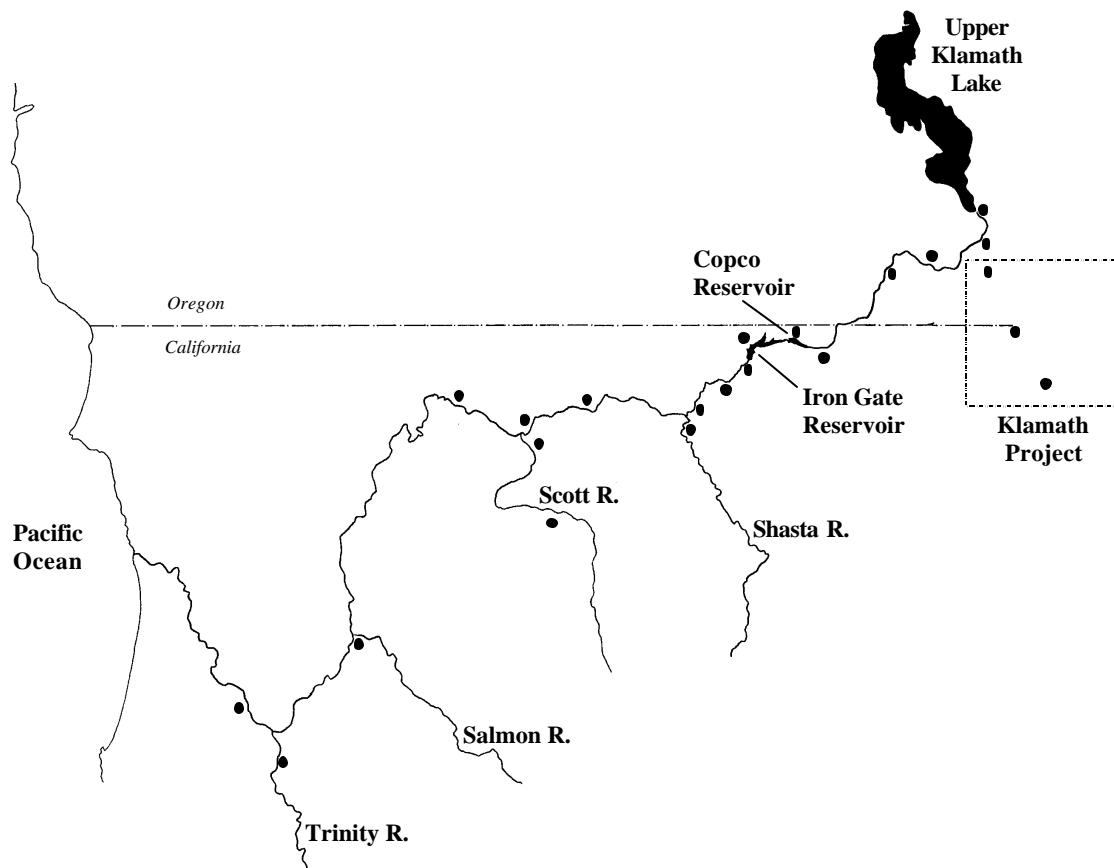


KLAMATH RIVER WATER QUALITY 2000

— DATA APPENDIX —



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Napa, CA 95449

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This document accompanies the *Klamath River Water Quality Monitoring Program: 2000* report and its associated appendices. An electronic data set containing the water quality data addressed herein is an integral part of this report. The data listing is included in the main report.

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A SEMI-MONTHLY DATA BY SAMPLING SITE

Table A-1 Tule Lake Outlet Channel (TLO) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	uS/cm	mV	NTU	
TLO	05/01/00	15:00	<0.05	4.9	2.62	0.82	0.41	23	1.34j	-	-	-	-	-	-	-	-	61.2	
TLO	05/09/00	10:59	0.41	2.2	<0.05	0.51	0.22	5.0	19.0j	378	10.0	246	256	12.33	8.31	470	8.93	-	-
TLO	05/23/00	08:10	0.74	2.2	0.15	0.64	0.25	6.0	17.0j	536	36	321	357	17.33	7.40	732	9.04	-	44.97
TLO	06/06/00	12:30	0.17	2.2	0.6	0.38	0.24	4.0	10j	484	48	290	338	18.69	8.86	691	9.34	412	23.37
TLO	06/20/00	14:40	0.13	2.5	<0.05	0.43	0.25	4.0	10j	448	48	207	255	19.98	9.43	635	9.54	411	21.13
TLO	07/11/00	12:00	0.31	2.0	0.44	0.45	0.43	6.0	16	365	60	119	179	-	-	-	-	-	11.13
TLO	07/25/00	11:45	0.08	2.6	0.45	0.35	0.15	7.0	21j	373	59	109	168	20.68	6.80	489	9.67	412	10.47
TLO	08/08/00	13:15	0.14	2.0	0.72	0.23	0.17	5.0	11j	337	50	101	150	22.02	5.74	438	9.80	96	8.48
TLO	08/22/00	10:30	0.22	3.9	0.07	0.18	0.17	5.0	15j	336	69.1	79	148	17.42	6.40	427	9.90	104	8.81
TLO	09/12/00	10:45	0.11	2.4	1.28	0.30	0.08	9.0	57	380	49.9	129	179	18.08	8.62	517	9.60	332	18.27
TLO	09/26/00	13:00	0.06	4.2	<0.05	0.29	0.11	13.0	40j	377	65.3	130	195	14.20	10.43	495	9.54	173	26.53
TLO	10/17/00	08:00	0.06	3.9	<0.05	0.42	<0.05	11.0	74	356	17.3	181	198	9.96	9.49	500	9.17	158	55.4
TLO	10/31/00	13:30	0.55	2.7	0.17	0.24	0.07	9.0	28j	253	<1.4	205	205	7.19	10.30	368	8.77	203	67.3
TLO	11/14/00	13:00	0.12	3.6	0.06	0.27	0.06	12	38j	350	24	197	222	1.87	12.17	452	9.18	252	57.1

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-2 Klamath Straits Drain at Headworks (KSDH) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KSDH	05/01/00	14:15	0.09	2.3	1.00	0.52	0.51	5.0	0.80j	-	-	-	-	-	-	-	-	6.77	
KSDH	05/09/00	11:56	0.55	2.4	<0.05	0.47	0.37	4.0	22	527	<1.4	348	348	14.16	8.95	663	8.54	304	-
KSDH	05/23/00	12:50	0.51	2.3	<0.05	0.69	0.59	3.0	3.40j	592	10	400	410	21.74	9.18	829	9.08	-	14.57
KSDH	06/06/00	11:30	0.19	2.7	0.55	0.36	0.33	4.0	3.48j	596	<1.4	342	342	19.95	8.37	819	9.22	495	12.1
KSDH	06/20/00	13:45	0.26	5.4	<0.05	0.63	0.46	<3.0	1j	1150	<1.4	439	439	23.79	7.24	1495	9.09	411	6.28
KSDH	07/11/00	11:20	0.31	2.0	0.56	0.51	0.51	<3.0	5j	390	48	132	180	22.20	8.02	504	9.31	351	4.59
KSDH	07/25/00	11:05	0.15	2.4	<0.05	0.91	0.27	<3.0	2j	365	40	131	171	22.97	5.24	487	9.30	432	5.52
KSDH	08/08/00	12:10	0.09	2.4	0.58	0.24	0.24	6.0	18j	342	29	127	156	23.73	7.03	419	9.37	108	6.39
KSDH	08/22/00	11:30	0.1	3.9	<0.05	0.17	0.17	<3.0	2j	463	51.8	172	224	19.71	8.29	623	9.40	111	5.44
KSDH	09/12/00	11:30	<0.05	3.8	<0.05	0.33	<0.05	16.0	95	370	54.7	139	193	19.58	11.67	570	9.73	317	30.4
KSDH	09/26/00	12:10	5.58	8.6	<0.05	0.64	0.22	12.0	51	477	<1.4	336	336	14.53	1.46	698	7.77	197	289.67
KSDH	10/17/00	09:15	2.24	5.0	0.07	0.83	0.15	19.0	136	470	<1.4	420	420	5.39	7.85	720	8.01	201	112.33
KSDH	10/31/00	12:30	<0.05	3.7	<0.05	0.40	0.11	4.0	74	453	24.0	351	376	5.85	11.33	638	9.11	210	24.3
KSDH	11/14/00	11:45	0.43	2.0	0.21	0.24	0.09	5	30j	369	<1.4	264	264	2.97	11.98	568	7.67	196	14.37

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-3 Klamath Straits Drain at Highway 97 (KSD97) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KSD97	05/01/00	11:45	0.19	2.3	1.29	0.61	0.56	8.0	6.99j	-	-	-	-	-	-	-	-	18	
KSD97	05/09/00	08:00	0.67	2.3	0.37	0.57	0.40	4.0	<0.01j	369	<1.4	236	236	14.23	6.62	460	8.38	311	-
KSD97	05/23/00	11:30	0.80	<0.2	0.08	0.62	0.49	5.0	7.12j	510	10	324	334	20.82	6.80	707	8.94	-	-
KSD97	06/06/00	10:00	0.34	2.2	0.68	0.48	0.36	4.0	4.11j	409	<1.4	262	262	19.81	5.79	561	8.95	575	16.37
KSD97	06/20/00	11:00	0.72	3.9	0.06	0.90	0.62	6.0	13j	491	<1.4	230	230	21.19	2.18	663	8.02	487	-
KSD97	07/11/00	09:30	0.80	2.1	1.00	0.76	0.66	3.0	2j	368	<1.4	187	187	21.63	3.14	516	8.57	374	8.99
KSD97	07/25/00	09:15	0.22	2.4	0.64	0.66	0.35	8.0	9j	279	<1.4	142	142	22.86	1.69	340	7.75	542	13.37
KSD97	08/08/00	07:50	0.82	2.8	1.12	0.27	0.25	<3.0	5j	347	<1.4	180	180	23.23	2.26	475	8.46	335	8.49
KSD97	08/22/00	08:45	0.24	5.0	1.22	0.31	0.29	7.0	15j	395	<1.4	207	207	19.83	1.62	522	7.89	91	6.27
KSD97	09/12/00	08:30	0.29	2.5	1.35	0.28	0.11	8.0	49	386	24	171	195	17.55	4.98	528	9.20	230	16.33
KSD97	09/26/00	10:00	1.73	4.8	2.29	0.27	0.23	7.0	0j	382	<1.4	248	248	12.97	2.76	525	7.65	208	8.34
KSD97	10/17/00	10:30	2.47	4.0	0.21	0.29	0.14	4.0	4j	472	<1.4	349	349	9.91	3.20	740	7.60	198	14.87
KSD97	10/31/00	09:00	0.57	1.8	0.53	0.10	0.09	4.0	28j	396	<1.4	234	234	6.74	7.09	565	7.92	216	7.89
KSD97	11/14/00	09:00	0.07	2.1	0.14	0.14	<0.05	7	75	430	<1.4	244	244	4.14	10.01	590	8.51	450	13.5

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-4 Klamath River at Miller Island (KRMI) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KRMI	05/01/00	10:30	<0.05	0.9	<0.05	0.22	0.16	4.0	11.0j	-	-	-	-	-	-	-	-	7.22	
KRMI	05/09/00	14:36	0.29	0.8	<0.05	0.34	0.27	<3.0	17.0j	31	<1.4	61	61	14.76	8.66	104	7.86	362	-
KRMI	05/23/00	09:15	0.27	0.8	<0.05	0.28	0.28	4.0	19j	74	<1.4	60	60	18.26	9.13	108	8.43	-	8.12
KRMI	06/06/00	07:30	0.12	2.0	1.69	0.37	0.15	8.0	288	90	<1.4	51	51	18.77	10.63	102	9.33	564	50.57
KRMI	06/20/00	08:40	0.30	4.0	0.19	0.71	0.38	6.0	96	80	<1.4	55	55	19.11	3.10	103	9.33	510	37.73
KRMI	07/11/00	07:30	0.63	2.4	1.79	0.56	0.52	8.0	81	115	9	51	59	19.54	2.38	107	9.01	470	48.27
KRMI	07/25/00	08:00	0.84	3.7	2.05	0.44	0.22	10.0	22j	106	<1.4	21	21	22.77	0.29	117	8.54	428	7.11
KRMI	08/08/00	06:50	1.53	3.2	2.30	0.24	0.24	7.0	6j	123	<1.4	73	73	23.56	1.20	121	7.59	-47	6.45
KRMI	08/22/00	13:30	0.91	2.8	0.18	0.08	0.06	<3.0	6j	138	<1.4	74	74	20.00	3.03	126	7.17	186	3.98
KRMI	09/12/00	13:15	0.36	0.8	0.70	0.25	0.14	5.0	25j	144	<1.4	128	128	16.95	2.03	205	7.21	393	24.1
KRMI	09/26/00	07:45	0.35	1.6	0.26	0.19	0.15	4.0	11j	151	<1.4	120	120	14.50	3.09	202	7.54	54	28.83
KRMI	10/17/00	13:30	0.47	2.1	0.10	0.15	0.05	5.0	33j	140	<1.4	76	76	11.46	5.26	134	7.39	169	15.7
KRMI	10/31/00	08:30	0.40	1.7	0.13	0.08	<0.05	5.0	14j	102	<1.4	71	71	7.48	5.45	118	7.34	178	9.22
KRMI	11/14/00	08:00	0.43	1.4	0.42	0.09	0.07	<3	4j	107	<1.4	82	82	4.19	6.32	156	7.34	448	13.6

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-5 Klamath River at Keno (KRK) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KRK	05/01/00	13:00	<0.05	0.9	0.34	0.23	0.17	5.0	7.01j	-	-	-	-	13.54	8.90	133	7.66	419	6.59
KRK	05/09/00	12:58	0.36	0.8	0.07	0.61	0.12	<3.0	2.34j	100	<1.4	75	75	13.99	7.80	129	7.58	354	-
KRK	05/23/00	13:30	0.35	1.2	0.05	0.36	0.34	5.0	18j	227	<1.4	156	156	19.10	8.52	315	9.00	-	7.72
KRK	06/06/00	08:45	0.12	1.4	0.39	0.27	0.33	<3.0	20j	182	<1.4	119	119	18.19	8.57	237	8.96	604	10.05
KRK	06/20/00	09:45	0.68	2.2	0.07	0.46	0.38	4.0	6j	130	<1.4	68	68	19.41	3.32	152	8.95	548	4.98
KRK	07/11/00	08:50	0.71	1.8	1.31	0.62	0.62	4.0	15j	138	<1.4	72	72	18.97	1.72	165	7.89	444	3.5
KRK	07/25/00	13:15	0.46	2.6	1.08	0.40	0.24	8.0	20j	184	1.9	53	55	23.12	2.87	220	8.41	408	4.7
KRK	08/08/00	10:45	1.11	3.0	1.89	0.24	0.25	8.0	22j	145	<1.4	82	82	23.08	0.53	155	7.71	-185	5.02
KRK	08/22/00	12:30	1.47	3.5	0.10	0.14	0.16	<3.0	17j	168	<1.4	89	89	20.36	3.02	176	7.28	177	2.64
KRK	09/12/00	12:30	0.41	2.0	1.06	0.24	0.11	8.0	35j	202	<1.4	135	135	16.72	5.80	272	7.94	364	12.93
KRK	09/26/00	09:00	0.43	1.5	0.13	0.17	0.17	<3.0	0j	178	<1.4	139	139	15.19	2.50	231	7.51	185	13
KRK	10/17/00	12:30	0.53	1.7	0.23	0.13	0.07	<3.0	4j	94	<1.4	84.9	84.9	11.61	2.80	150	7.22	202	9.8
KRK	10/31/00	11:30	0.26	1.2	0.31	0.05	<0.05	3.0	1j	110	<1.4	69	69	7.98	6.10	131	7.17	265	10.09
KRK	11/14/00	11:00	0.27	1.0	0.48	0.08	0.06	<3	2j	102	<1.4	80	80	4.39	5.46	149	7.13	480	7.77

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-6 Klamath River above Copco Reservoir (KRCR) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KRCR	05/09/00	13:50	0.10	<0.2	0.19	0.24	0.23	3.0	2.67j	102	<1.4	70	70	-	-	-	-	-	
KRCR	05/23/00	16:10	0.23	0.3	0.25	0.25	0.13	<3.0	0.80j	183	<1.4	127	127	19.97	8.65	251	8.31	317	8.47
KRCR	06/06/00	13:10	0.10	1.0	0.30	0.30	0.26	<3.0	5.72j	176	<1.4	113	113	18.81	7.96	231	8.45	281	6.48
KRCR	06/20/00	16:35	0.21	1.8	0.57	0.43	0.39	<3.0	6j	96	<1.4	70	70	18.27	7.86	144	8.45	304	5.43
KRCR	07/11/00	14:15	<0.05	0.5	0.41	0.42	0.16	<3.0	2j	104	<1.4	75	75	17.02	8.04	143	8.44	289	0.69
KRCR	07/25/00	13:40	0.08	0.3	0.42	0.33	0.25	<3.0	2j	144	<1.4	78	78	21.02	9.49	169	8.75	298	2.86
KRCR	08/07/00	15:13	<0.05	1.0	0.61	0.16	0.17	<3.0	23j	129	<1.4	76	76	19.62	8.11	145	8.41	322	4.01
KRCR	08/22/00	14:55	<0.05	0.8	0.36	0.08	<0.05	<3.0	2j	136	9.6	74	84	17.86	9.53	145	8.71	327	2.57
KRCR	09/12/00	14:35	<0.05	0.6	0.38	0.14	0.10	2.0	20j	164	9.6	103	112	18.15	9.71	232	8.23	152	1.42
KRCR	09/26/00	13:45	<0.05	0.6	0.31	0.11	0.12	<3.0	1j	115	<1.4	108	108	13.91	10.97	182	8.76	-	2.13
KRCR	10/17/00	14:00	0.05	0.9	0.68	0.17	0.09	<3.0	1j	156	<1.4	83	83	10.00	-	-	-	-	-
KRCR	10/31/00	12:30	<0.05	0.5	0.49	0.06	0.05	3.0	1j	109	<1.4	75	75	9.02	10.75	127	8.57	332	6.09
KRCR	11/14/00	13:15	<0.05	<0.2	0.43	0.07	0.08	<3	1j	122	<1.4	79	79	5.76	11.38	135	8.34	381	3.58

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-7 Klamath River below Iron Gate Reservoir (KRIG) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KRIG	05/09/00	13:00	0.30	<0.2	0.15	0.29	0.18	<3.0	1.34j	76	<1.4	70	70	-	-	-	-	-	
KRIG	05/23/00	14:22	0.26	<0.2	0.10	0.26	0.26	<3.0	4.50j	86	<1.4	83	83	15.42	9.76	155	8.32	307	4.67
KRIG	06/06/00	12:18	0.10	0.7	0.06	0.21	0.29	<3.0	5.07j	153	<1.4	106	106	17.99	8.57	207	8.28	298	-
KRIG	06/20/00	15:42	0.05	1.6	0.18	0.41	0.34	<3.0	1j	159	<1.4	107	107	19.81	7.69	211	7.92	322	2.01
KRIG	07/11/00	13:00	0.30	4.5	0.28	0.32	0.12	<3.0	3j	129	<1.4	90	90	20.50	7.31	180	7.74	305	1.36
KRIG	07/25/00	12:30	0.09	0.8	0.36	0.11	0.19	<3.0	2j	129	<1.4	87	87	21.54	8.06	168	8.44	301	1.37
KRIG	08/07/00	12:15	<0.05	1.8	0.24	0.11	0.15	<3.0	11j	132	3.8	80	84	23.00	7.98	171	8.51	371	-
KRIG	08/22/00	13:35	<0.05	1.3	0.24	0.13	0.17	<3.0	6j	146	<1.4	84	84	21.29	6.63	171	8.45	330	2.39
KRIG	09/12/00	13:30	0.06	0.9	0.58	0.20	0.17	3.0	6j	131	<1.4	87	87	19.35	5.91	188	7.01	179	1.03
KRIG	09/26/00	12:20	<0.05	0.7	0.57	0.13	0.15	<3.0	1j	131	<1.4	81	81	17.35	6.00	165	7.61	-	1.8
KRIG	10/17/00	12:50	0.07	0.7	0.52	0.19	0.15	<3.0	2j	136	<1.4	102	102	13.00	-	-	-	-	-
KRIG	10/31/00	11:30	<0.05	0.7	0.63	0.10	0.13	14.0	0j	133	<1.4	93	93	12.59	6.34	171	7.47	356	5.42
KRIG	11/14/00	12:05	0.09	0.6	0.65	0.12	0.12	<3	1j	122	<1.4	84	84	9.81	6.46	152	7.30	404	3.88

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-8 Klamath River near Seiad Valley (KRSV) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
KRSV	05/09/00	10:30	0.64	<0.2	<0.05	0.29	0.19	<3.0	0.53j	85	<1.4	90	90	-	-	-	-	-	
KRSV	05/23/00	12:01	0.19	<0.2	0.05	0.17	0.17	3.0	2.40j	92	<1.4	78	78	16.42	9.57	138	8.24	312	10.53
KRSV	06/06/00	09:50	0.05	0.4	<0.05	0.12	0.16	<3.0	0.53j	114	<1.4	93	93	15.91	8.80	125	8.07	298	-
KRSV	06/20/00	11:47	0.18	1.2	0.09	0.37	0.23	<3.0	0j	140	<1.4	107	107	19.30	8.85	202	8.22	326	2.47
KRSV	07/11/00	10:00	0.26	0.2	<0.05	0.32	0.32	<3.0	0j	134	<1.4	111	111	20.88	7.55	212	8.23	328	2.54
KRSV	07/25/00	09:55	0.22	1.4	0.09	0.26	0.14	<3.0	2j	155	<1.4	45	45	21.87	8.39	197	8.23	320	1.54
KRSV	08/07/00	11:45	0.05	1.2	0.10	0.11	0.13	<3.0	9j	138	<1.4	96	96	-	-	-	-	-	-
KRSV	08/22/00	10:30	<0.05	1.6	0.11	0.12	0.14	<3.0	7j	153	<1.4	99	99	21.06	8.27	190	8.44	320	4.23
KRSV	09/12/00	10:30	0.07	0.7	0.39	0.17	0.15	<3.0	0j	149	<1.4	108	108	19.73	7.50	219	7.58	130	2.14
KRSV	09/26/00	10:30	<0.05	0.9	0.42	0.12	0.14	<3.0	3j	149	<1.4	104	104	15.60	9.48	197	8.22	-	2.27
KRSV	10/17/00	10:10	<0.05	0.6	0.44	0.16	0.13	<3.0	0j	165	<1.4	132	132	11.00	-	-	-	-	-
KRSV	10/31/00	08:45	<0.05	0.5	0.48	0.09	0.11	3.0	2j	160	<1.4	139	139	11.20	9.87	213	7.97	342	5.29
KRSV	11/14/00	09:20	0.05	0.3	0.53	0.09	0.11	<3	1j	156	<1.4	110	110	6.86	10.83	202	7.96	395	3.59

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-9 Shasta River near mouth (SHR) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
SHR	05/09/00	12:15	0.48	0.2	<0.05	0.45	0.39	<3.0	1.34j	316	<1.4	339	339	-	-	-	-	-	-
SHR	05/23/00	13:35	0.22	<0.2	<0.05	0.52	0.57	<3.0	0.50j	379	29	329	358	23.00	8.48	545	8.63	308	1.87
SHR	06/06/00	11:42	0.08	0.8	<0.05	0.31	0.48	<3.0	1.07j	335	34	319	353	17.95	9.34	509	8.57	284	-
SHR	06/20/00	13:45	0.27	1.5	<0.05	0.60	0.46	<3.0	3j	326	<1.4	311	311	22.93	7.91	491	8.59	305	8.97
SHR	07/11/00	12:00	0.32	0.3	<0.05	0.58	0.53	<3.0	2j	313	<1.4	287	287	21.71	8.32	481	8.57	286	5.45
SHR	07/25/00	11:25	<0.05	0.5	<0.05	0.33	0.25	<3.0	1j	314	<1.4	295	295	22.39	8.51	496	8.61	309	2.08
SHR	08/07/00	10:45	0.05	1.0	<0.05	0.17	0.2	<3.0	3j	351	<1.4	311	311	21.75	8.38	525	8.35	369	-
SHR	08/22/00	12:35	<0.05	0.6	<0.05	0.14	0.19	<3.0	0j	356	8	318	326	21.31	8.21	529	8.70	302	3.29
SHR	09/12/00	12:30	0.05	1.0	<0.05	0.21	0.18	<3.0	6j	399	<1.4	435	435	20.22	8.69	685	8.17	156	2.14
SHR	09/26/00	15:15	0.17	0.5	<0.05	0.13	0.16	<3.0	0j	343	24.0	352	376	16.46	9.14	516	8.73	-	3.1
SHR	10/17/00	12:00	<0.05	0.4	0.26	0.24	0.16	<3.0	1j	299	<1.4	276	276	10.00	-	-	-	-	-
SHR	10/31/00	10:30	<0.05	0.4	0.24	0.21	0.16	<3.0	0j	287	<1.4	268	268	9.01	10.80	425	8.47	326	4.29
SHR	11/14/00	11:20	<0.05	<0.2	0.24	0.13	0.17	<3	1j	309	<1.4	266	266	5.81	11.47	434	8.51	384	1.9

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table A-10 Scott River near Ft. Jones (SCR) semi-monthly water quality data

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
SCR	05/09/00	09:40	0.52	<0.2	0.15	0.21	0.08	<3.0	1.60j	73	<1.4	73	73	-	-	-	-	-	
SCR	05/23/00	10:02	0.21	0.2	<0.05	0.16	0.16	5.0	1.10j	56	<1.4	49	49	11.85	9.48	77	7.64	351	24.8
SCR	06/06/00	07:45	0.06	0.4	0.08	0.08	0.09	<3.0	0.27j	76	<1.4	75	75	13.34	8.49	113	7.53	318	6.02
SCR	06/20/00	09:46	0.09	0.9	0.27	0.21	0.16	<3.0	2j	100	<1.4	88	88	15.64	8.31	144	7.73	332	4.45
SCR	07/11/00	08:00	0.36	0.4	0.20	0.09	0.17	<3.0	2j	144	<1.4	142	142	17.02	7.31	229	7.76	312	1.25
SCR	07/25/00	08:00	<0.05	<0.2	0.34	0.16	<0.05	<3.0	1j	178	<1.4	164	164	16.19	9.17	270	7.83	295	1
SCR	08/07/00	08:47	<0.05	0.5	0.25	0.05	<0.05	<3.0	46	164	<1.4	154	154	17.13	7.77	250	7.76	333	2.22
SCR	08/22/00	07:55	<0.05	0.5	0.12	<0.05	<0.05	<3.0	3j	92	16.3	76	92	15.14	6.89	215	7.73	315	4.87
SCR	09/12/00	08:30	0.08	<0.2	0.14	<0.05	<0.05	<3.0	13j	156	<1.4	152	152	15.60	7.59	287	7.55	148	1.13
SCR	09/26/00	07:45	<0.05	0.2	0.30	<0.05	<0.05	<3.0	2j	161	<1.4	165	165	11.91	7.86	277	7.85	-	1.77
SCR	10/17/00	08:20	<0.05	<0.2	0.39	<0.05	<0.05	<3.0	1j	178	<1.4	190	190	9.00	-	-	-	-	-
SCR	10/31/00	07:15	<0.05	<0.2	0.40	<0.05	<0.05	4.0	3j	169	<1.4	175	175	9.26	9.00	273	7.74	355	2.62
SCR	11/14/00	08:10	<0.05	<0.2	0.47	<0.05	<0.05	<3	5j	173	<1.4	170	170	6.13	9.70	272	7.79	401	0.94

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

B SEMI-MONTHLY DATA BY SAMPLING DATE

Table B-1 Semi-monthly water quality data: May 1, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
TLO	5/1/00	15:00	<0.05	4.9	2.62	0.82	0.41	23	1.34j	-	-	-	-	-	-	-	-	-	61.2	
KSDH	5/1/00	14:15	0.09	2.3	1.00	0.52	0.51	5.0	0.80j	-	-	-	-	-	-	-	-	-	6.77	
KSD97	5/1/00	11:45	0.19	2.3	1.29	0.61	0.56	8.0	6.99j	-	-	-	-	-	-	-	-	-	18	
KRMI	5/1/00	10:30	<0.05	0.9	<0.05	0.22	0.16	4.0	11.0j	-	-	-	-	-	-	-	-	-	7.22	
KRK	5/1/00	13:00	<0.05	0.9	0.34	0.23	0.17	5.0	7.01j	-	-	-	-	-	13.54	8.90	133	7.66	419	6.59

(<) less than reporting limit
(j) below reporting limit of 40 ug/l
(-) no data available

Table B-2 Semi-monthly water quality data: May 9, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	5/9/00	10:59	0.41	2.2	<0.05	0.51	0.22	5.0	19.0j	378	10.0	246	256	12.33	8.31	470	8.93	-	-
KSDH	5/9/00	11:56	0.55	2.4	<0.05	0.47	0.37	4.0	22j	527	<1.4	348	348	14.16	8.95	663	8.54	304	-
KSD97	5/9/00	8:00	0.67	2.3	0.37	0.57	0.40	4.0	<0.01j	369	<1.4	236	236	14.23	6.62	460	8.38	311	-
KRMI	5/9/00	14:36	0.29	0.8	<0.05	0.34	0.27	<3.0	17.0j	31	<1.4	61	61	14.76	8.66	104	7.86	362	-
KRK	5/9/00	12:58	0.36	0.8	0.07	0.61	0.12	<3.0	2.34j	100	<1.4	75	75	13.99	7.80	129	7.58	354	-
KRCR	5/9/00	13:50	0.10	<0.2	0.19	0.24	0.23	3.0	2.67j	102	<1.4	70	70	-	-	-	-	-	-
KRIG	5/9/00	13:00	0.30	<0.2	0.15	0.29	0.18	<3.0	1.34j	76	<1.4	70	70	-	-	-	-	-	-
KRSV	5/9/00	10:30	0.64	<0.2	<0.05	0.29	0.19	<3.0	0.53j	85	<1.4	90	90	-	-	-	-	-	-
SHR	5/9/00	12:15	0.48	0.2	<0.05	0.45	0.39	<3.0	1.34j	316	<1.4	339	339	-	-	-	-	-	-
SCR	5/9/00	9:40	0.52	<0.2	0.15	0.21	0.08	<3.0	1.60j	73	<1.4	73	73	-	-	-	-	-	-

(<) less than reporting limit
(j) below reporting limit of 40 ug/l
(-) no data available

Table B-3 Semi-monthly water quality data: May 23, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
TLO	5/23/00	8:10	0.74	2.2	0.15	0.64	0.25	6.0	17.0j	536	36	321	357	17.33	7.40	732	9.04	-	44.97
KSDH	5/23/00	12:50	0.51	2.3	<0.05	0.69	0.59	3.0	3.40j	592	10	400	410	21.74	9.18	829	9.08	-	14.57
KSD97	5/23/00	11:30	0.80	<0.2	0.08	0.62	0.49	5.0	7.12j	510	10	324	334	20.82	6.80	707	8.94	-	-
KRMI	5/23/00	9:15	0.27	0.8	<0.05	0.28	0.28	4.0	19j	74	<1.4	60	60	18.26	9.13	108	8.43	-	8.12
KRK	5/23/00	13:30	0.35	1.2	0.05	0.36	0.34	5.0	18j	227	<1.4	156	156	19.10	8.52	315	9.00	-	7.72
KRCR	5/23/00	16:10	0.23	0.3	0.25	0.25	0.13	<3.0	0.80j	183	<1.4	127	127	19.97	8.65	251	8.31	317	8.47
KRIG	5/23/00	14:22	0.26	<0.2	0.10	0.26	0.26	<3.0	4.50j	86	<1.4	83	83	15.42	9.76	155	8.32	307	4.67
KRSV	5/23/00	12:01	0.19	<0.2	0.05	0.17	0.17	3.0	2.40j	92	<1.4	78	78	16.42	9.57	138	8.24	312	10.53
SHR	5/23/00	13:35	0.22	<0.2	<0.05	0.52	0.57	<3.0	0.50j	379	29	329	358	23.00	8.48	545	8.63	308	1.87
SCR	5/23/00	10:02	0.21	0.2	<0.05	0.16	0.16	5.0	1.10j	56	<1.4	49	49	11.85	9.48	77	7.64	351	24.8

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-4 Semi-monthly water quality data: June 6, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
TLO	6/6/00	12:30	0.17	2.2	0.6	0.38	0.24	4.0	10j	484	48	290	338	18.69	8.86	691	9.34	412	23.37
KSDH	6/6/00	11:30	0.19	2.7	0.55	0.36	0.33	4.0	3.48j	596	<1.4	342	342	19.95	8.37	819	9.22	495	12.1
KSD97	6/6/00	10:00	0.34	2.2	0.68	0.48	0.36	4.0	4.11j	409	<1.4	262	262	19.81	5.79	561	8.95	575	16.37
KRMI	6/6/00	7:30	0.12	2.0	1.69	0.37	0.15	8.0	288	90	<1.4	51	51	18.77	10.63	102	9.33	564	50.57
KRK	6/6/00	8:45	0.12	1.4	0.39	0.27	0.33	<3.0	20j	182	<1.4	119	119	18.19	8.57	237	8.96	604	10.05
KRCR	6/6/00	13:10	0.10	1.0	0.30	0.30	0.26	<3.0	5.72j	176	<1.4	113	113	18.81	7.96	231	8.45	281	6.48
KRIG	6/6/00	12:18	0.10	0.7	0.06	0.21	0.29	<3.0	5.07j	153	<1.4	106	106	17.99	8.57	207	8.28	298	-
KRSV	6/6/00	9:50	0.05	0.4	<0.05	0.12	0.16	<3.0	0.53j	114	<1.4	93	93	15.91	8.80	125	8.07	298	-
SHR	6/6/00	11:42	0.08	0.8	<0.05	0.31	0.48	<3.0	1.07j	335	34	319	353	17.95	9.34	509	8.57	284	-
SCR	6/6/00	7:45	0.06	0.4	0.08	0.08	0.09	<3.0	0.27j	76	<1.4	75	75	13.34	8.49	113	7.53	318	6.02

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-5 Semi-monthly water quality data: June 20, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	6/20/00	14:40	0.13	2.5	<0.05	0.43	0.25	4.0	10j	448	48	207	255	19.98	9.43	635	9.54	411	21.13
KSDH	6/20/00	13:45	0.26	5.4	<0.05	0.63	0.46	<3.0	1j	1150	<1.4	439	439	23.79	7.24	1495	9.09	411	6.28
KSD97	6/20/00	11:00	0.72	3.9	0.06	0.90	0.62	6.0	13j	491	<1.4	230	230	21.19	2.18	663	8.02	487	-
KRMI	6/20/00	8:40	0.30	4.0	0.19	0.71	0.38	6.0	96	80	<1.4	55	55	19.11	3.10	103	9.33	510	37.73
KRK	6/20/00	9:45	0.68	2.2	0.07	0.46	0.38	4.0	6j	130	<1.4	68	68	19.41	3.32	152	8.95	548	4.98
KRCR	6/20/00	16:35	0.21	1.8	0.57	0.43	0.39	<3.0	6j	96	<1.4	70	70	18.27	7.86	144	8.45	304	5.43
KRIG	6/20/00	15:42	0.05	1.6	0.18	0.41	0.34	<3.0	1j	159	<1.4	107	107	19.81	7.69	211	7.92	322	2.01
KRSV	6/20/00	11:47	0.18	1.2	0.09	0.37	0.23	<3.0	0j	140	<1.4	107	107	19.30	8.85	202	8.22	326	2.47
SHR	6/20/00	13:45	0.27	1.5	<0.05	0.60	0.46	<3.0	3j	326	<1.4	311	311	22.93	7.91	491	8.59	305	8.97
SCR	6/20/00	9:46	0.09	0.9	0.27	0.21	0.16	<3.0	2j	100	<1.4	88	88	15.64	8.31	144	7.73	332	4.45

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-6 Semi-monthly water quality data: July 11, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	7/11/00	12:00	0.31	2.0	0.44	0.45	0.43	6.0	16j	365	60	119	179	-	-	-	-	-	11.13
KSDH	7/11/00	11:20	0.31	2.0	0.56	0.51	0.51	<3.0	5j	390	48	132	180	22.20	8.02	504	9.31	351	4.59
KSD97	7/11/00	9:30	0.80	2.1	1.00	0.76	0.66	3.0	2j	368	<1.4	187	187	21.63	3.14	516	8.57	374	8.99
KRMI	7/11/00	7:30	0.63	2.4	1.79	0.56	0.52	8.0	81	115	9	51	59	19.54	2.38	107	9.01	470	48.27
KRK	7/11/00	8:50	0.71	1.8	1.31	0.62	0.62	4.0	15j	138	<1.4	72	72	18.97	1.72	165	7.89	444	3.5
KRCR	7/11/00	14:15	<0.05	0.5	0.41	0.42	0.16	<3.0	2j	104	<1.4	75	75	17.02	8.04	143	8.44	289	0.69
KRIG	7/11/00	13:00	0.30	4.5	0.28	0.32	0.12	<3.0	3j	129	<1.4	90	90	20.50	7.31	180	7.74	305	1.36
KRSV	7/11/00	10:00	0.26	0.2	<0.05	0.32	0.32	<3.0	0j	134	<1.4	111	111	20.88	7.55	212	8.23	328	2.54
SHR	7/11/00	12:00	0.32	0.3	<0.05	0.58	0.53	<3.0	2j	313	<1.4	287	287	21.71	8.32	481	8.57	286	5.45
SCR	7/11/00	8:00	0.36	0.4	0.20	0.09	0.17	<3.0	2j	144	<1.4	142	142	17.02	7.31	229	7.76	312	1.25

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-7 Semi-monthly water quality data: July 25, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
TLO	7/25/00	11:45	0.08	2.6	0.45	0.35	0.15	7.0	21j	373	59	109	168	20.68	6.80	489	9.67	412	10.47
KSDH	7/25/00	11:05	0.15	2.4	<0.05	0.91	0.27	<3.0	2j	365	40	131	171	22.97	5.24	487	9.30	432	5.52
KSD97	7/25/00	9:15	0.22	2.4	0.64	0.66	0.35	8.0	9j	279	<1.4	142	142	22.86	1.69	340	7.75	542	13.37
KRMI	7/25/00	8:00	0.84	3.7	2.05	0.44	0.22	10.0	22j	106	<1.4	21	21	22.77	0.29	117	8.54	428	7.11
KRK	7/25/00	13:15	0.46	2.6	1.08	0.40	0.24	8.0	20j	184	1.9	53	55	23.12	2.87	220	8.41	408	4.7
KRCR	7/25/00	13:40	0.08	0.3	0.42	0.33	0.25	<3.0	2j	144	<1.4	78	78	21.02	9.49	169	8.75	298	2.86
KRIG	7/25/00	12:30	0.09	0.8	0.36	0.11	0.19	<3.0	2j	129	<1.4	87	87	21.54	8.06	168	8.44	301	1.37
KRSV	7/25/00	9:55	0.22	1.4	0.09	0.26	0.14	<3.0	2j	155	<1.4	45	45	21.87	8.39	197	8.23	320	1.54
SHR	7/25/00	11:25	<0.05	0.5	<0.05	0.33	0.25	<3.0	1j	314	<1.4	295	295	22.39	8.51	496	8.61	309	2.08
SCR	7/25/00	8:00	<0.05	<0.2	0.34	0.16	<0.05	<3.0	1j	178	<1.4	164	164	16.19	9.17	270	7.83	295	1

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-8 Semi-monthly water quality data: August 8, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KRCR	8/7/00	15:13	<0.05	1.0	0.61	0.16	0.17	<3.0	23j	129	<1.4	76	76	19.62	8.11	145	8.41	322	4.01
KRIG	8/7/00	12:15	<0.05	1.8	0.24	0.11	0.15	<3.0	11j	132	3.8	80	84	23.00	7.98	171	8.51	371	-
KRSV	8/7/00	11:45	0.05	1.2	0.10	0.11	0.13	<3.0	9j	138	<1.4	96	96	-	-	-	-	-	-
SHR	8/7/00	10:45	0.05	1.0	<0.05	0.17	0.2	<3.0	3j	351	<1.4	311	311	21.75	8.38	525	8.35	369	-
SCR	8/7/00	8:47	<0.05	0.5	0.25	0.05	<0.05	<3.0	46	164	<1.4	154	154	17.13	7.77	250	7.76	333	2.22
TLO	8/8/00	13:15	0.14	2.0	0.72	0.23	0.17	5.0	11j	337	50	101	150	22.02	5.74	438	9.80	96	8.48
KSDH	8/8/00	12:10	0.09	2.4	0.58	0.24	0.24	6.0	18j	342	29	127	156	23.73	7.03	419	9.37	108	6.39
KSD97	8/8/00	7:50	0.82	2.8	1.12	0.27	0.25	<3.0	5j	347	<1.4	180	180	23.23	2.26	475	8.46	335	8.49
KRMI	8/8/00	6:50	1.53	3.2	2.30	0.24	0.24	7.0	6j	123	<1.4	73	73	23.56	1.20	121	7.59	-47	6.45
KRK	8/8/00	10:45	1.11	3.0	1.89	0.24	0.25	8.0	22j	145	<1.4	82	82	23.08	0.53	155	7.71	-185	5.02

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-9 Semi-monthly water quality data: August 22, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	8/22/00	10:30	0.22	3.9	0.07	0.18	0.17	5.0	15j	336	69.1	79	148	17.42	6.40	427	9.90	104	8.81
KSDH	8/22/00	11:30	0.1	3.9	<0.05	0.17	0.17	<3.0	2j	463	51.8	172	224	19.71	8.29	623	9.40	111	5.44
KSD97	8/22/00	8:45	0.24	5.0	1.22	0.31	0.29	7.0	15j	395	<1.4	207	207	19.83	1.62	522	7.89	91	6.27
KRMI	8/22/00	13:30	0.91	2.8	0.18	0.08	0.06	<3.0	6j	138	<1.4	74	74	20.00	3.03	126	7.17	186	3.98
KRK	8/22/00	12:30	1.47	3.5	0.10	0.14	0.16	<3.0	17j	168	<1.4	89	89	20.36	3.02	176	7.28	177	2.64
KRCR	8/22/00	14:55	<0.05	0.8	0.36	0.08	<0.05	<3.0	2j	136	9.6	74	84	17.86	9.53	145	8.71	327	2.57
KRIG	8/22/00	13:35	<0.05	1.3	0.24	0.13	0.17	<3.0	6j	146	<1.4	84	84	21.29	6.63	171	8.45	330	2.39
KRSV	8/22/00	10:30	<0.05	1.6	0.11	0.12	0.14	<3.0	7j	153	<1.4	99	99	21.06	8.27	190	8.44	320	4.23
SHR	8/22/00	12:35	<0.05	0.6	<0.05	0.14	0.19	<3.0	0j	356	8	318	326	21.31	8.21	529	8.70	302	3.29
SCR	8/22/00	7:55	<0.05	0.5	0.12	<0.05	<0.05	<3.0	3j	92	16.3	76	92	15.14	6.89	215	7.73	315	4.87

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-10 Semi-monthly water quality data: September 12, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV
TLO	9/12/00	10:45	0.11	2.4	1.28	0.30	0.08	9.0	57	380	49.9	129	179	18.08	8.62	517	9.60	332	18.27
KSDH	9/12/00	11:30	<0.05	3.8	<0.05	0.33	<0.05	16.0	95	370	54.7	139	193	19.58	11.67	570	9.73	317	30.4
KSD97	9/12/00	8:30	0.29	2.5	1.35	0.28	0.11	8.0	49	386	24	171	195	17.55	4.98	528	9.20	230	16.33
KRMI	9/12/00	13:15	0.36	0.8	0.70	0.25	0.14	5.0	25j	144	<1.4	128	128	16.95	2.03	205	7.21	393	24.1
KRK	9/12/00	12:30	0.41	2.0	1.06	0.24	0.11	8.0	35j	202	<1.4	135	135	16.72	5.80	272	7.94	364	12.93
KRCR	9/12/00	14:35	<0.05	0.6	0.38	0.14	0.10	2.0	20j	164	9.6	103	112	18.15	9.71	232	8.23	152	1.42
KRIG	9/12/00	13:30	0.06	0.9	0.58	0.20	0.17	3.0	6j	131	<1.4	87	87	19.35	5.91	188	7.01	179	1.03
KRSV	9/12/00	10:30	0.07	0.7	0.39	0.17	0.15	<3.0	0j	149	<1.4	108	108	19.73	7.50	219	7.58	130	2.14
SHR	9/12/00	12:30	0.05	1.0	<0.05	0.21	0.18	<3.0	6j	399	<1.4	435	435	20.22	8.69	685	8.17	156	2.14
SCR	9/12/00	8:30	0.08	<0.2	0.14	<0.05	<0.05	<3.0	13j	156	<1.4	152	152	15.60	7.59	287	7.55	148	1.13

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-11 Semi-monthly water quality data: September 26, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	9/26/00	13:00	0.06	4.2	<0.05	0.29	0.11	13.0	40j	377	65.3	130	195	14.20	10.43	495	9.54	173	26.53
KSDH	9/26/00	12:10	5.58	8.6	<0.05	0.64	0.22	12.0	51	477	<1.4	336	336	14.53	1.46	698	7.77	197	289.67
KSD97	9/26/00	10:00	1.73	4.8	2.29	0.27	0.23	7.0	0j	382	<1.4	248	248	12.97	2.76	525	7.65	208	8.34
KRMI	9/26/00	7:45	0.35	1.6	0.26	0.19	0.15	4.0	11j	151	<1.4	120	120	14.50	3.09	202	7.54	54	28.83
KRK	9/26/00	9:00	0.43	1.5	0.13	0.17	0.17	<3.0	0j	178	<1.4	139	139	15.19	2.50	231	7.51	185	13
KRCR	9/26/00	13:45	<0.05	0.6	0.31	0.11	0.12	<3.0	1j	115	<1.4	108	108	13.91	10.97	182	8.76	-	2.13
KRIG	9/26/00	12:20	<0.05	0.7	0.57	0.13	0.15	<3.0	1j	131	<1.4	81	81	17.35	6.00	165	7.61	-	1.8
KRSV	9/26/00	10:30	<0.05	0.9	0.42	0.12	0.14	<3.0	3j	149	<1.4	104	104	15.60	9.48	197	8.22	-	2.27
SHR	9/26/00	15:15	0.17	0.5	<0.05	0.13	0.16	<3.0	0j	343	24.0	352	376	16.46	9.14	516	8.73	-	3.1
SCR	9/26/00	7:45	<0.05	0.2	0.30	<0.05	<0.05	<3.0	2j	161	<1.4	165	165	11.91	7.86	277	7.85	-	1.77

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-12 Semi-monthly water quality data: October 17, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	10/17/00	8:00	0.06	3.9	<0.05	0.42	<0.05	11.0	74	356	17.3	181	198	9.96	9.49	500	9.17	158	55.4
KSDH	10/17/00	9:15	2.24	5.0	0.07	0.83	0.15	19.0	136	470	<1.4	420	420	5.39	7.85	720	8.01	201	112.33
KSD97	10/17/00	10:30	2.47	4.0	0.21	0.29	0.14	4.0	4j	472	<1.4	349	349	9.91	3.20	740	7.60	198	14.87
KRMI	10/17/00	13:30	0.47	2.1	0.10	0.15	0.05	5.0	33j	140	<1.4	76	76	11.46	5.26	134	7.39	169	15.7
KRK	10/17/00	12:30	0.53	1.7	0.23	0.13	0.07	<3.0	4j	94	<1.4	84.9	84.9	11.61	2.80	150	7.22	202	9.8
KRCR	10/17/00	14:00	0.05	0.9	0.68	0.17	0.09	<3.0	1j	156	<1.4	83	83	10.00	-	-	-	-	-
KRIG	10/17/00	12:50	0.07	0.7	0.52	0.19	0.15	<3.0	2j	136	<1.4	102	102	13.00	-	-	-	-	-
KRSV	10/17/00	10:10	<0.05	0.6	0.44	0.16	0.13	<3.0	0j	165	<1.4	132	132	11.00	-	-	-	-	-
SHR	10/17/00	12:00	<0.05	0.4	0.26	0.24	0.16	<3.0	1j	299	<1.4	276	276	10.00	-	-	-	-	-
SCR	10/17/00	8:20	<0.05	<0.2	0.39	<0.05	<0.05	<3.0	1j	178	<1.4	190	190	9.00	-	-	-	-	-

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-13 Semi-monthly water quality data: October 31, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU
TLO	10/31/00	13:30	0.55	2.7	0.17	0.24	0.07	9.0	28j	253	<1.4	205	205	7.19	10.30	368	8.77	203	67.3
KSDH	10/31/00	12:30	<0.05	3.7	<0.05	0.40	0.11	4.0	74	453	24.0	351	376	5.85	11.33	638	9.11	210	24.3
KSD97	10/31/00	9:00	0.57	1.8	0.53	0.10	0.09	4.0	28j	396	<1.4	234	234	6.74	7.09	565	7.92	216	7.89
KRMI	10/31/00	8:30	0.40	1.7	0.13	0.08	<0.05	5.0	14j	102	<1.4	71	71	7.48	5.45	118	7.34	178	9.22
KRK	10/31/00	11:30	0.26	1.2	0.31	0.05	<0.05	3.0	1j	110	<1.4	69	69	7.98	6.10	131	7.17	265	10.09
KRCR	10/31/00	12:30	<0.05	0.5	0.49	0.06	0.05	3.0	1j	109	<1.4	75	75	9.02	10.75	127	8.57	332	6.09
KRIG	10/31/00	11:30	<0.05	0.7	0.63	0.10	0.13	14.0	0j	133	<1.4	93	93	12.59	6.34	171	7.47	356	5.42
KRSV	10/31/00	8:45	<0.05	0.5	0.48	0.09	0.11	3.0	2j	160	<1.4	139	139	11.20	9.87	213	7.97	342	5.29
SHR	10/31/00	10:30	<0.05	0.4	0.24	0.21	0.16	<3.0	0j	287	<1.4	268	268	9.01	10.80	425	8.47	326	4.29
SCR	10/31/00	7:15	<0.05	<0.2	0.40	<0.05	<0.05	4.0	3j	169	<1.4	175	175	9.26	9.00	273	7.74	355	2.62

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table B-14 Semi-monthly water quality data: November 14, 2000

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV
TLO	11/14/00	13:00	0.12	3.6	0.06	0.27	0.06	12	38j	350	24	197	222	1.87	12.17	452	9.18	252	57.1
KSDH	11/14/00	11:45	0.43	2.0	0.21	0.24	0.09	5	30j	369	<1.4	264	264	2.97	11.98	568	7.67	196	14.37
KSD97	11/14/00	9:00	0.07	2.1	0.14	0.14	<0.05	7	75	430	<1.4	244	244	4.14	10.01	590	8.51	450	13.5
KRMI	11/14/00	8:00	0.43	1.4	0.42	0.09	0.07	<3	4j	107	<1.4	82	82	4.19	6.32	156	7.34	448	13.6
KRK	11/14/00	11:00	0.27	1.0	0.48	0.08	0.06	<3	2j	102	<1.4	80	80	4.39	5.46	149	7.13	480	7.77
KRCR	11/14/00	13:15	<0.05	<0.2	0.43	0.07	0.08	<3	1j	122	<1.4	79	79	5.76	11.38	135	8.34	381	3.58
KRIG	11/14/00	12:05	0.09	0.6	0.65	0.12	0.12	<3	1j	122	<1.4	84	84	9.81	6.46	152	7.30	404	3.88
KRSV	11/14/00	9:20	0.05	0.3	0.53	0.09	0.11	<3	1j	156	<1.4	110	110	6.86	10.83	202	7.96	395	3.59
SHR	11/14/00	11:20	<0.05	<0.2	0.24	0.13	0.17	<3	1j	309	<1.4	266	266	5.81	11.47	434	8.51	384	1.9
SCR	11/14/00	8:10	<0.05	<0.2	0.47	<0.05	<0.05	<3	5j	173	<1.4	170	170	6.13	9.70	272	7.79	401	0.94

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

C SEMI-MONTHLY DATA BY SAMPLING SITE: SUMMARY STATISTICS

Table C-1 Tule Lake Outlet Channel (TLO) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.) NTU
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	
TLO	05/01/00	15:00	0.04	4.9	2.62	0.82	0.41	23	1.34j	-	-	-	-	-	-	-	-	-	61.2
TLO	05/09/00	10:59	0.41	2.2	0.01	0.51	0.22	5.0	19.0j	378	10.0	246	256	12.33	8.31	470	8.93	-	-
TLO	05/23/00	08:10	0.74	2.2	0.15	0.64	0.25	6.0	17.0j	536	36	321	357	17.33	7.40	732	9.04	-	44.97
TLO	06/06/00	12:30	0.17	2.2	0.6	0.38	0.24	4.0	10j	484	48	290	338	18.69	8.86	691	9.34	412	23.37
TLO	06/20/00	14:40	0.13	2.5	0.02	0.43	0.25	4.0	10j	448	48	207	255	19.98	9.43	635	9.54	411	21.13
TLO	07/11/00	12:00	0.31	2.0	0.44	0.45	0.43	6.0	16	365	60	119	179	-	-	-	-	-	11.13
TLO	07/25/00	11:45	0.08	2.6	0.45	0.35	0.15	7.0	21j	373	59	109	168	20.68	6.80	489	9.67	412	10.47
TLO	08/08/00	13:15	0.14	2.0	0.72	0.23	0.17	5.0	11j	337	50	101	150	22.02	5.74	438	9.80	96	8.48
TLO	08/22/00	10:30	0.22	3.9	0.07	0.18	0.17	5.0	15j	336	69.1	79	148	17.42	6.40	427	9.90	104	8.81
TLO	09/12/00	10:45	0.11	2.4	1.28	0.30	0.08	9.0	57	380	49.9	129	179	18.08	8.62	517	9.60	332	18.27
TLO	09/26/00	13:00	0.06	4.2	0.03	0.29	0.11	13.0	40j	377	65.3	130	195	14.20	10.43	495	9.54	173	26.53
TLO	10/17/00	08:00	0.06	3.9	0.04	0.42	0.05	11.0	74	356	17.3	181	198	9.96	9.49	500	9.17	158	55.4
TLO	10/31/00	13:30	0.55	2.7	0.17	0.24	0.07	9.0	28j	253	<1.4	205	205	7.19	10.30	368	8.77	203	67.3
TLO	11/14/00	13:00	0.12	3.6	0.06	0.27	0.06	12	38j	350	24	197	222	1.87	12.17	452	9.18	252	57.1
average			0.22	3.0	0.48	0.39	0.19	8.5	-	383	-	178	219	14.98	8.66	518	-	255	31.9
minimum			0.04	2.0	0.01	0.18	0.05	4.0	-	253	<1.4	79	148	1.87	5.74	368	8.77	96	8.5
maximum			0.74	4.9	2.62	0.82	0.43	23.0	74	536	69.1	321	357	22.02	12.17	732	9.90	412	67.3
median			0.14	2.6	0.16	0.37	0.17	6.5	-	373	-	181	198	17.38	8.74	492	-	228	23.4
std. dev			0.209	0.95	0.716	0.174	0.120	5.13	-	71.5	-	75.4	66.2	6.085	1.865	110.8	-	127.6	22.07
X ₂₅			0.08	2.2	0.04	0.27	0.08	5.0	-	-	-	-	-	-	-	-	-	-	
X ₇₅			0.31	3.9	0.60	0.45	0.25	11.0	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-2 Klamath Straits Drain at Headworks (KSDH) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KSDH	05/01/00	14:15	0.09	2.3	1.00	0.52	0.51	5.0	0.80j	-	-	-	-	-	-	-	-	-	6.77	
KSDH	05/09/00	11:56	0.55	2.4	<0.05	0.47	0.37	4.0	22j	527	<1.4	348	348	14.16	8.95	663	8.54	304	-	
KSDH	05/23/00	12:50	0.51	2.3	<0.05	0.69	0.59	3.0	3.40j	592	10	400	410	21.74	9.18	829	9.08	-	14.57	
KSDH	06/06/00	11:30	0.19	2.7	0.55	0.36	0.33	4.0	3.48j	596	<1.4	342	342	19.95	8.37	819	9.22	495	12.1	
KSDH	06/20/00	13:45	0.26	5.4	<0.05	0.63	0.46	1.2	1j	1150	<1.4	439	439	23.79	7.24	1495	9.09	411	6.28	
KSDH	07/11/00	11:20	0.31	2.0	0.56	0.51	0.51	1.4	5j	390	48	132	180	22.20	8.02	504	9.31	351	4.59	
KSDH	07/25/00	11:05	0.15	2.4	<0.05	0.91	0.27	1.7	2j	365	40	131	171	22.97	5.24	487	9.30	432	5.52	
KSDH	08/08/00	12:10	0.09	2.4	0.58	0.24	0.24	6.0	18j	342	29	127	156	23.73	7.03	419	9.37	108	6.39	
KSDH	08/22/00	11:30	0.1	3.9	<0.05	0.17	0.17	2.1	2j	463	51.8	172	224	19.71	8.29	623	9.40	111	5.44	
KSDH	09/12/00	11:30	0.03	3.8	<0.05	0.33	0.05	16.0	95	370	54.7	139	193	19.58	11.67	570	9.73	317	30.4	
KSDH	09/26/00	12:10	5.58	8.6	<0.05	0.64	0.22	12.0	51	477	<1.4	336	336	14.53	1.46	698	7.77	197	289.67	
KSDH	10/17/00	09:15	2.24	5.0	0.07	0.83	0.15	19.0	136	470	<1.4	420	420	5.39	7.85	720	8.01	201	112.33	
KSDH	10/31/00	12:30	0.04	3.7	<0.05	0.40	0.11	4.0	74	453	24.0	351	376	5.85	11.33	638	9.11	210	24.3	
KSDH	11/14/00	11:45	0.43	2.0	0.21	0.24	0.09	5	30j	369	<1.4	264	264	2.97	11.98	568	7.67	196	14.37	
			average	0.76	3.5	-	0.50	0.29	6.0	-	505	-	277	297	16.66	8.20	695	-	278	41.0
			minimum	0.03	2.0	<0.05	0.17	0.05	1.2	-	342	<1.4	127	156	2.97	1.46	419	7.67	108	4.6
			maximum	5.58	8.6	1.00	0.91	0.59	19.0	136	1150	54.7	439	439	23.79	11.98	1495	9.73	495	289.7
			median	0.23	2.6	-	0.49	0.26	4.0	-	463	-	336	336	19.71	8.29	638	-	257	12.1
			std. dev	1.498	1.84	-	0.224	0.174	5.59	-	211.1	-	120.8	102.9	7.460	2.804	269.4	-	126.7	80.10
			X ₂₅	0.09	2.3	-	0.33	0.15	2.1	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.51	3.9	-	0.64	0.46	6.0	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-3 Klamath Straits Drain at Highway 97(KSD97) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KSD97	05/01/00	11:45	0.19	2.3	1.29	0.61	0.56	8.0	6.99j	-	-	-	-	-	-	-	-	-	18	
KSD97	05/09/00	08:00	0.67	2.3	0.37	0.57	0.40	4.0	<0.01j	369	<1.4	236	236	14.23	6.62	460	8.38	311	-	
KSD97	05/23/00	11:30	0.80	1.6	0.08	0.62	0.49	5.0	7.12j	510	10	324	334	20.82	6.80	707	8.94	-	-	
KSD97	06/06/00	10:00	0.34	2.2	0.68	0.48	0.36	4.0	4.11j	409	<1.4	262	262	19.81	5.79	561	8.95	575	16.37	
KSD97	06/20/00	11:00	0.72	3.9	0.06	0.90	0.62	6.0	13j	491	<1.4	230	230	21.19	2.18	663	8.02	487	-	
KSD97	07/11/00	09:30	0.80	2.1	1.00	0.76	0.66	3.0	2j	368	<1.4	187	187	21.63	3.14	516	8.57	374	8.99	
KSD97	07/25/00	09:15	0.22	2.4	0.64	0.66	0.35	8.0	9j	279	<1.4	142	142	22.86	1.69	340	7.75	542	13.37	
KSD97	08/08/00	07:50	0.82	2.8	1.12	0.27	0.25	3.0	5j	347	<1.4	180	180	23.23	2.26	475	8.46	335	8.49	
KSD97	08/22/00	08:45	0.24	5.0	1.22	0.31	0.29	7.0	15j	395	<1.4	207	207	19.83	1.62	522	7.89	91	6.27	
KSD97	09/12/00	08:30	0.29	2.5	1.35	0.28	0.11	8.0	49	386	24	171	195	17.55	4.98	528	9.20	230	16.33	
KSD97	09/26/00	10:00	1.73	4.8	2.29	0.27	0.23	7.0	0j	382	<1.4	248	248	12.97	2.76	525	7.65	208	8.34	
KSD97	10/17/00	10:30	2.47	4.0	0.21	0.29	0.14	4.0	4j	472	<1.4	349	349	9.91	3.20	740	7.60	198	14.87	
KSD97	10/31/00	09:00	0.57	1.8	0.53	0.10	0.09	4.0	28j	396	<1.4	234	234	6.74	7.09	565	7.92	216	7.89	
KSD97	11/14/00	09:00	0.07	2.1	0.14	0.14	0.05	7	75	430	<1.4	244	244	4.14	10.01	590	8.51	450	13.5	
			average	0.71	2.8	0.78	0.45	0.33	5.6	-	403	-	232	234	16.53	4.47	553	-	335	12.0
			minimum	0.07	1.6	0.06	0.10	0.05	3.0	-	279	<1.4	142	142	4.14	1.62	340	7.60	91	6.3
			maximum	2.47	5.0	2.29	0.90	0.66	8.0	75	510	24.0	349	349	23.23	10.01	740	9.20	575	18.0
			median	0.62	2.4	0.66	0.40	0.32	5.5	-	395	-	234	234	19.81	3.20	528	-	323	13.4
			std. dev	0.659	1.11	0.634	0.243	0.199	1.91	-	62.2	-	58.4	58.0	6.357	2.612	106.5	-	153.3	4.13
			X ₂₅	0.24	2.1	0.21	0.27	0.14	4.0	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.80	3.9	1.22	0.62	0.49	7.0	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-4 Klamath River at Miller Island (KRMI) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₂ ⁻ + NO ₃ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KRMI	05/01/00	10:30	0.05	0.9	0.03	0.22	0.16	4.0	11.0j	-	-	-	-	-	-	-	-	-	7.22	
KRMI	05/09/00	14:36	0.29	0.8	0.04	0.34	0.27	2.7	17.0j	31	<1.4	61	61	14.76	8.66	104	7.86	362	-	
KRMI	05/23/00	09:15	0.27	0.8	0.05	0.28	0.28	4.0	19j	74	<1.4	60	60	18.26	9.13	108	8.43	-	8.12	
KRMI	06/06/00	07:30	0.12	2.0	1.69	0.37	0.15	8.0	288	90	<1.4	51	51	18.77	10.63	102	9.33	564	50.57	
KRMI	06/20/00	08:40	0.30	4.0	0.19	0.71	0.38	6.0	96	80	<1.4	55	55	19.11	3.10	103	9.33	510	37.73	
KRMI	07/11/00	07:30	0.63	2.4	1.79	0.56	0.52	8.0	81	115	9	51	59	19.54	2.38	107	9.01	470	48.27	
KRMI	07/25/00	08:00	0.84	3.7	2.05	0.44	0.22	10.0	22j	106	<1.4	21	21	22.77	0.29	117	8.54	428	7.11	
KRMI	08/08/00	06:50	1.53	3.2	2.30	0.24	0.24	7.0	6j	123	<1.4	73	73	23.56	1.20	121	7.59	-47	6.45	
KRMI	08/22/00	13:30	0.91	2.8	0.18	0.08	0.06	3.0	6j	138	<1.4	74	74	20.00	3.03	126	7.17	186	3.98	
KRMI	09/12/00	13:15	0.36	0.8	0.70	0.25	0.14	5.0	25j	144	<1.4	128	128	16.95	2.03	205	7.21	393	24.1	
KRMI	09/26/00	07:45	0.35	1.6	0.26	0.19	0.15	4.0	11j	151	<1.4	120	120	14.50	3.09	202	7.54	54	28.83	
KRMI	10/17/00	13:30	0.47	2.1	0.10	0.15	0.05	5.0	33j	140	<1.4	76	76	11.46	5.26	134	7.39	169	15.7	
KRMI	10/31/00	08:30	0.40	1.7	0.13	0.08	0.05	5.0	14j	102	<1.4	71	71	7.48	5.45	118	7.34	178	9.22	
KRMI	11/14/00	08:00	0.43	1.4	0.42	0.09	0.07	3.0	4j	107	<1.4	82	82	4.19	6.32	156	7.34	448	13.6	
			average	0.50	2.0	0.71	0.29	0.20	5.3	-	108	-	71	72	16.26	4.66	131	-	310	20.1
			minimum	0.05	0.8	0.03	0.08	0.05	2.7	-	31	<1.4	21	21	4.19	0.29	102	7.17	-47	4.0
			maximum	1.53	4.0	2.30	0.71	0.52	10.0	288	151	9.0	128	128	23.56	10.63	205	9.33	564	50.6
			median	0.38	1.9	0.23	0.25	0.16	5.0	-	107	-	71	71	18.26	3.10	118	-	378	13.6
			std. dev.	0.383	1.08	0.848	0.186	0.136	2.20	-	33.6	-	28.3	28.0	5.704	3.242	35.5	-	195.0	16.40
			X ₂₅	0.29	0.9	0.10	0.15	0.07	4.0	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.63	2.8	1.69	0.37	0.27	7.0	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-5 Klamath River at Keno (KRK) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KRK	05/01/00	13:00	0.05	0.9	0.34	0.23	0.17	5.0	7.01j	-	-	-	-	13.54	8.90	133	7.66	419	6.59	
KRK	05/09/00	12:58	0.36	0.8	0.07	0.61	0.12	1.3	2.34j	100	<1.4	75	75	13.99	7.80	129	7.58	354	-	
KRK	05/23/00	13:30	0.35	1.2	0.05	0.36	0.34	5.0	18j	227	<1.4	156	156	19.10	8.52	315	9.00	-	7.72	
KRK	06/06/00	08:45	0.12	1.4	0.39	0.27	0.33	1.5	20j	182	<1.4	119	119	18.19	8.57	237	8.96	604	10.05	
KRK	06/20/00	09:45	0.68	2.2	0.07	0.46	0.38	4.0	6j	130	<1.4	68	68	19.41	3.32	152	8.95	548	4.98	
KRK	07/11/00	08:50	0.71	1.8	1.31	0.62	0.62	4.0	15j	138	<1.4	72	72	18.97	1.72	165	7.89	444	3.5	
KRK	07/25/00	13:15	0.46	2.6	1.08	0.40	0.24	8.0	20j	184	1.9	53	55	23.12	2.87	220	8.41	408	4.7	
KRK	08/08/00	10:45	1.11	3.0	1.89	0.24	0.25	8.0	22j	145	<1.4	82	82	23.08	0.53	155	7.71	-185	5.02	
KRK	08/22/00	12:30	1.47	3.5	0.10	0.14	0.16	1.8	17j	168	<1.4	89	89	20.36	3.02	176	7.28	177	2.64	
KRK	09/12/00	12:30	0.41	2.0	1.06	0.24	0.11	8.0	35j	202	<1.4	135	135	16.72	5.80	272	7.94	364	12.93	
KRK	09/26/00	09:00	0.43	1.5	0.13	0.17	0.17	2.0	0j	178	<1.4	139	139	15.19	2.50	231	7.51	185	13	
KRK	10/17/00	12:30	0.53	1.7	0.23	0.13	0.07	2.4	4j	94	<1.4	84.9	84.9	11.61	2.80	150	7.22	202	9.8	
KRK	10/31/00	11:30	0.26	1.2	0.31	0.05	0.05	3.0	1j	110	<1.4	69	69	7.98	6.10	131	7.17	265	10.09	
KRK	11/14/00	11:00	0.27	1.0	0.48	0.08	0.06	2.7	2j	102	<1.4	80	80	4.39	5.46	149	7.13	480	7.77	
			average	0.52	1.8	0.54	0.29	0.22	4.0	-	151	-	94	94	16.12	4.85	187	-	328	7.6
			minimum	0.05	0.8	0.05	0.05	0.05	1.3	-	94	<1.4	53	55	4.39	0.53	129	7.13	-185	2.6
			maximum	1.47	3.5	1.89	0.62	0.62	8.0	-	227	1.9	156	156	23.12	8.90	315	9.00	604	13.0
			median	0.42	1.6	0.33	0.24	0.17	3.5	-	145	-	82	82	17.46	4.39	160	-	364	7.7
			std. dev	0.382	0.81	0.571	0.182	0.157	2.45	-	42.8	-	32.2	32.0	5.436	2.815	58.3	-	204.9	3.40
			X ₂₅	0.27	1.2	0.10	0.14	0.11	2.0	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.68	2.2	1.06	0.40	0.33	5.0	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-6 Klamath River above Copco Reservoir (KRCR) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU		
KRCR	05/09/00	13:50	0.10	0.2	0.19	0.24	0.23	3.0	2.67j	102	<1.4	70	70	-	-	-	-	-		
KRCR	05/23/00	16:10	0.23	0.3	0.25	0.25	0.13	<3.0	0.80j	183	<1.4	127	127	19.97	8.65	251	8.31	317	8.47	
KRCR	06/06/00	13:10	0.10	1.0	0.30	0.30	0.26	<3.0	5.72j	176	<1.4	113	113	18.81	7.96	231	8.45	281	6.48	
KRCR	06/20/00	16:35	0.21	1.8	0.57	0.43	0.39	<3.0	6j	96	<1.4	70	70	18.27	7.86	144	8.45	304	5.43	
KRCR	07/11/00	14:15	<0.05	0.5	0.41	0.42	0.16	<3.0	2j	104	<1.4	75	75	17.02	8.04	143	8.44	289	0.69	
KRCR	07/25/00	13:40	0.08	0.3	0.42	0.33	0.25	<3.0	2j	144	<1.4	78	78	21.02	9.49	169	8.75	298	2.86	
KRCR	08/07/00	15:13	<0.05	1.0	0.61	0.16	0.17	<3.0	23j	129	<1.4	76	76	19.62	8.11	145	8.41	322	4.01	
KRCR	08/22/00	14:55	<0.05	0.8	0.36	0.08	0.05	<3.0	2j	136	9.6	74	84	17.86	9.53	145	8.71	327	2.57	
KRCR	09/12/00	14:35	<0.05	0.6	0.38	0.14	0.10	2.0	20j	164	9.6	103	112	18.15	9.71	232	8.23	152	1.42	
KRCR	09/26/00	13:45	<0.05	0.6	0.31	0.11	0.12	<3.0	1j	115	<1.4	108	108	13.91	10.97	182	8.76	-	2.13	
KRCR	10/17/00	14:00	0.05	0.9	0.68	0.17	0.09	<3.0	1j	156	<1.4	83	83	10.00	-	-	-	-	-	
KRCR	10/31/00	12:30	<0.05	0.5	0.49	0.06	0.05	3.0	1j	109	<1.4	75	75	9.02	10.75	127	8.57	332	6.09	
KRCR	11/14/00	13:15	<0.05	0.2	0.43	0.07	0.08	<3	1j	122	<1.4	79	79	5.76	11.38	135	8.34	381	3.58	
			average	-	0.7	0.42	0.21	0.16	-	134	-	87	89	15.78	9.31	173	-	300	4.0	
			minimum	<0.05	0.2	0.19	0.06	0.05	2.0	-	96	<1.4	70	70	5.76	7.86	127	8.23	152	0.7
			maximum	0.23	1.8	0.68	0.43	0.39	3.0	-	183	9.6	127	127	21.02	11.38	251	8.76	381	8.5
			median	-	0.6	0.41	0.17	0.13	-	-	129	-	78	79	18.01	9.49	145	-	311	3.6
			std. dev	-	0.44	0.143	0.128	0.099	-	-	29.1	-	18.9	19.3	4.951	1.295	44.6	-	59.2	2.39
			X ₂₅	-	0.3	0.31	0.11	0.09	-	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	-	0.9	0.49	0.30	0.23	-	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-7 Klamath River below Iron Gate Reservoir (KRIG) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KRIG	05/09/00	13:00	0.30	0.2	0.15	0.29	0.18	<3.0	1.34j	76	<1.4	70	70	-	-	-	-	-		
KRIG	05/23/00	14:22	0.26	0.2	0.10	0.26	0.26	<3.0	4.50j	86	<1.4	83	83	15.42	9.76	155	8.32	307	4.67	
KRIG	06/06/00	12:18	0.10	0.7	0.06	0.21	0.29	<3.0	5.07j	153	<1.4	106	106	17.99	8.57	207	8.28	298	-	
KRIG	06/20/00	15:42	0.05	1.6	0.18	0.41	0.34	<3.0	1j	159	<1.4	107	107	19.81	7.69	211	7.92	322	2.01	
KRIG	07/11/00	13:00	0.30	4.5	0.28	0.32	0.12	<3.0	3j	129	<1.4	90	90	20.50	7.31	180	7.74	305	1.36	
KRIG	07/25/00	12:30	0.09	0.8	0.36	0.11	0.19	<3.0	2j	129	<1.4	87	87	21.54	8.06	168	8.44	301	1.37	
KRIG	08/07/00	12:15	0.02	1.8	0.24	0.11	0.15	<3.0	11j	132	3.8	80	84	23.00	7.98	171	8.51	371	-	
KRIG	08/22/00	13:35	0.02	1.3	0.24	0.13	0.17	<3.0	6j	146	<1.4	84	84	21.29	6.63	171	8.45	330	2.39	
KRIG	09/12/00	13:30	0.06	0.9	0.58	0.20	0.17	3.0	6j	131	<1.4	87	87	19.35	5.91	188	7.01	179	1.03	
KRIG	09/26/00	12:20	0.03	0.7	0.57	0.13	0.15	<3.0	1j	131	<1.4	81	81	17.35	6.00	165	7.61	-	1.8	
KRIG	10/17/00	12:50	0.07	0.7	0.52	0.19	0.15	<3.0	2j	136	<1.4	102	102	13.00	-	-	-	-	-	
KRIG	10/31/00	11:30	0.03	0.7	0.63	0.10	0.13	14.0	0j	133	<1.4	93	93	12.59	6.34	171	7.47	356	5.42	
KRIG	11/14/00	12:05	0.09	0.6	0.65	0.12	0.12	<3	1j	122	<1.4	84	84	9.81	6.46	152	7.30	404	3.88	
			average	0.11	1.1	0.35	0.20	0.19	-	-	128	-	89	89	17.64	7.34	176	-	317	2.7
			minimum	0.02	0.2	0.06	0.10	0.12	<3.0	-	76	<1.4	70	70	9.81	5.91	152	7.01	179	1.0
			maximum	0.30	4.5	0.65	0.41	0.34	14.0	-	159	3.8	107	107	23.00	9.76	211	8.51	404	5.4
			median	0.07	0.7	0.28	0.19	0.17	-	-	131	-	87	87	18.67	7.31	171	-	315	2.0
			std. dev	0.105	1.12	0.213	0.097	0.069	-	-	23.3	-	10.7	10.5	4.118	1.206	19.0	-	59.7	1.60
			X ₂₅	0.03	0.7	0.18	0.12	0.15	-	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.10	1.3	0.57	0.26	0.19	-	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-8 Klamath River near Seiad Valley (KRSV) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
KRSV	05/09/00	10:30	0.64	0.17	0.02	0.29	0.19	<3.0	0.53j	85	<1.4	90	90	-	-	-	-	-	-	
KRSV	05/23/00	12:01	0.19	0.2	0.05	0.17	0.17	3.0	2.40j	92	<1.4	78	78	16.42	9.57	138	8.24	312	10.53	
KRSV	06/06/00	09:50	0.05	0.4	0.03	0.12	0.16	<3.0	0.53j	114	<1.4	93	93	15.91	8.80	125	8.07	298	-	
KRSV	06/20/00	11:47	0.18	1.2	0.09	0.37	0.23	<3.0	0j	140	<1.4	107	107	19.30	8.85	202	8.22	326	2.47	
KRSV	07/11/00	10:00	0.26	0.2	0.04	0.32	0.32	<3.0	0j	134	<1.4	111	111	20.88	7.55	212	8.23	328	2.54	
KRSV	07/25/00	09:55	0.22	1.4	0.09	0.26	0.14	<3.0	2j	155	<1.4	45	45	21.87	8.39	197	8.23	320	1.54	
KRSV	08/07/00	11:45	0.05	1.2	0.10	0.11	0.13	<3.0	9j	138	<1.4	96	96	-	-	-	-	-	-	
KRSV	08/22/00	10:30	0.01	1.6	0.11	0.12	0.14	<3.0	7j	153	<1.4	99	99	21.06	8.27	190	8.44	320	4.23	
KRSV	09/12/00	10:30	0.07	0.7	0.39	0.17	0.15	<3.0	0j	149	<1.4	108	108	19.73	7.50	219	7.58	130	2.14	
KRSV	09/26/00	10:30	0.01	0.9	0.42	0.12	0.14	<3.0	3j	149	<1.4	104	104	15.60	9.48	197	8.22	-	2.27	
KRSV	10/17/00	10:10	0.02	0.6	0.44	0.16	0.13	<3.0	0j	165	<1.4	132	132	11.00	-	-	-	-	-	
KRSV	10/31/00	08:45	0.03	0.5	0.48	0.09	0.11	3.0	2j	160	<1.4	139	139	11.20	9.87	213	7.97	342	5.29	
KRSV	11/14/00	09:20	0.05	0.3	0.53	0.09	0.11	<3	1j	156	<1.4	110	110	6.86	10.83	202	7.96	395	3.59	
			average	0.14	0.7	0.21	0.18	0.16	-	-	138	-	101	101	16.35	8.91	190	-	308	3.8
			minimum	0.01	0.17	0.02	0.09	0.11	<3.0	-	85	<1.4	45	45	6.86	7.50	125	7.58	130	1.5
			maximum	0.64	1.6	0.53	0.37	0.32	3.0	-	165	-	139	139	21.87	10.83	219	8.44	395	10.5
			median	0.05	0.6	0.10	0.16	0.14	-	-	149	-	104	104	16.42	8.83	200	-	320	2.5
			std. dev	0.174	0.49	0.200	0.094	0.057	-	-	25.5	-	23.4	23.4	4.892	1.049	31.9	-	72.1	2.77
			X ₂₅	0.03	0.3	0.05	0.12	0.13	-	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.19	1.2	0.42	0.26	0.17	-	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-9 Shasta River near Mouth (SHR) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
SHR	05/09/00	12:15	0.48	0.2	<0.05	0.45	0.39	<3.0	1.34j	316	<1.4	339	339	-	-	-	-	-		
SHR	05/23/00	13:35	0.22	0.17	<0.05	0.52	0.57	<3.0	0.50j	379	29	329	358	23.00	8.48	545	8.63	308	1.87	
SHR	06/06/00	11:42	0.08	0.8	<0.05	0.31	0.48	<3.0	1.07j	335	34	319	353	17.95	9.34	509	8.57	284	-	
SHR	06/20/00	13:45	0.27	1.5	<0.05	0.60	0.46	<3.0	3j	326	<1.4	311	311	22.93	7.91	491	8.59	305	8.97	
SHR	07/11/00	12:00	0.32	0.3	<0.05	0.58	0.53	<3.0	2j	313	<1.4	287	287	21.71	8.32	481	8.57	286	5.45	
SHR	07/25/00	11:25	0.01	0.5	<0.05	0.33	0.25	<3.0	1j	314	<1.4	295	295	22.39	8.51	496	8.61	309	2.08	
SHR	08/07/00	10:45	0.05	1.0	<0.05	0.17	0.2	<3.0	3j	351	<1.4	311	311	21.75	8.38	525	8.35	369	-	
SHR	08/22/00	12:35	0.01	0.6	<0.05	0.14	0.19	<3.0	0j	356	8	318	326	21.31	8.21	529	8.70	302	3.29	
SHR	09/12/00	12:30	0.05	1.0	<0.05	0.21	0.18	<3.0	6j	399	<1.4	435	435	20.22	8.69	685	8.17	156	2.14	
SHR	09/26/00	15:15	0.17	0.5	<0.05	0.13	0.16	<3.0	0j	343	24.0	352	376	16.46	9.14	516	8.73	-	3.1	
SHR	10/17/00	12:00	0.02	0.4	0.26	0.24	0.16	<3.0	1j	299	<1.4	276	276	10.00	-	-	-	-	-	
SHR	10/31/00	10:30	0.02	0.4	0.24	0.21	0.16	<3.0	0j	287	<1.4	268	268	9.01	10.80	425	8.47	326	4.29	
SHR	11/14/00	11:20	0.03	0.2	0.24	0.13	0.17	<3	1j	309	<1.4	266	266	5.81	11.47	434	8.51	384	1.9	
			average	0.13	0.6	-	0.31	0.30	-	-	333	-	316	323	17.71	9.02	512	-	303	3.7
			minimum	0.01	0.17	0.05	0.13	0.16	<3.0	-	287	<1.4	266	266	5.81	7.91	425	8.17	156	1.9
			maximum	0.48	1.5	0.26	0.60	0.57	-	-	399	34.0	435	435	23.00	11.47	685	8.73	384	9.0
			median	0.05	0.5	-	0.24	0.20	-	-	326	-	311	311	20.77	8.51	509	-	307	3.1
			std. dev	0.149	0.39	-	0.173	0.160	-	-	32.1	-	44.7	48.9	6.083	1.129	68.4	-	61.3	2.33
			X ₂₅	0.02	0.3	-	0.17	0.17	-	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	0.22	0.8	-	0.45	0.46	-	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table C-10 Scott River near Ft. Jones (SCR) semi-monthly water quality data: summary statistics

Site	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	TP	PO ₄ ³⁻	BOD	Chlor_a	TDS	CO ₃ ²⁻	HCO ₃ ⁻	Total Alk.	Tw	DO	EC	pH	Redox	Turb. (avg.)	
			(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(°C)	(mg/l)	US/cm	mV	NTU	
SCR	05/09/00	09:40	0.52	0.05	0.15	0.21	0.08	<3.0	1.60j	73	<1.4	73	73	-	-	-	-	-		
SCR	05/23/00	10:02	0.21	0.2	0.05	0.16	0.16	5.0	1.10j	56	<1.4	49	49	11.85	9.48	77	7.64	351	24.8	
SCR	06/06/00	07:45	0.06	0.4	0.08	0.08	0.09	<3.0	0.27j	76	<1.4	75	75	13.34	8.49	113	7.53	318	6.02	
SCR	06/20/00	09:46	0.09	0.9	0.27	0.21	0.16	<3.0	2j	100	<1.4	88	88	15.64	8.31	144	7.73	332	4.45	
SCR	07/11/00	08:00	0.36	0.4	0.20	0.09	0.17	<3.0	2j	144	<1.4	142	142	17.02	7.31	229	7.76	312	1.25	
SCR	07/25/00	08:00	<0.05	0.06	0.34	0.16	<0.05	<3.0	1j	178	<1.4	164	164	16.19	9.17	270	7.83	295	1	
SCR	08/07/00	08:47	<0.05	0.5	0.25	0.05	<0.05	<3.0	46	164	<1.4	154	154	17.13	7.77	250	7.76	333	2.22	
SCR	08/22/00	07:55	<0.05	0.5	0.12	0.01	<0.05	<3.0	3j	92	16.3	76	92	15.14	6.89	215	7.73	315	4.87	
SCR	09/12/00	08:30	0.08	0.08	0.14	0.02	<0.05	<3.0	13j	156	<1.4	152	152	15.60	7.59	287	7.55	148	1.13	
SCR	09/26/00	07:45	<0.05	0.2	0.30	0.02	<0.05	<3.0	2j	161	<1.4	165	165	11.91	7.86	277	7.85	-	1.77	
SCR	10/17/00	08:20	<0.05	0.10	0.39	0.03	<0.05	<3.0	1j	178	<1.4	190	190	9.00	-	-	-	-	-	
SCR	10/31/00	07:15	<0.05	0.12	0.40	0.04	<0.05	4.0	3j	169	<1.4	175	175	9.26	9.00	273	7.74	355	2.62	
SCR	11/14/00	08:10	<0.05	0.15	0.47	0.05	<0.05	<3	5j	173	<1.4	170	170	6.13	9.70	272	7.79	401	0.94	
			average	-	0.3	0.24	0.09	-	-	132	-	129	130	13.18	8.32	219	-	316	4.6	
			minimum	<0.05	0.05	0.05	0.01	<0.05	<3.0	-	56	<1.4	49	49	6.13	6.89	77	7.53	148	0.9
			maximum	0.52	0.9	0.47	0.21	0.17	5.0	46.0	178	16.3	190	190	17.13	9.70	287	7.85	401	24.8
			median	-	0.2	0.25	0.05	-	-	156	-	152	152	14.24	8.31	250	-	325	2.2	
			std. dev	-	0.25	0.133	0.073	-	-	45.5	-	48.6	47.3	3.582	0.926	73.7	-	66.0	6.91	
			X ₂₅	-	0.1	0.27	0.03	-	-	-	-	-	-	-	-	-	-	-	-	
			X ₇₅	-	0.4	0.30	0.16	-	-	-	-	-	-	-	-	-	-	-	-	

Values in bold are estimated at or below the reporting limit (for nutrients and BOD only)

If more than 50% of the data are censored, values below the detection limit are not estimated.

D SEMI-MONTHLY DATA: GRAPHICAL PRESENTATION BY SITE

D.1 Tule Lake Outlet Channel

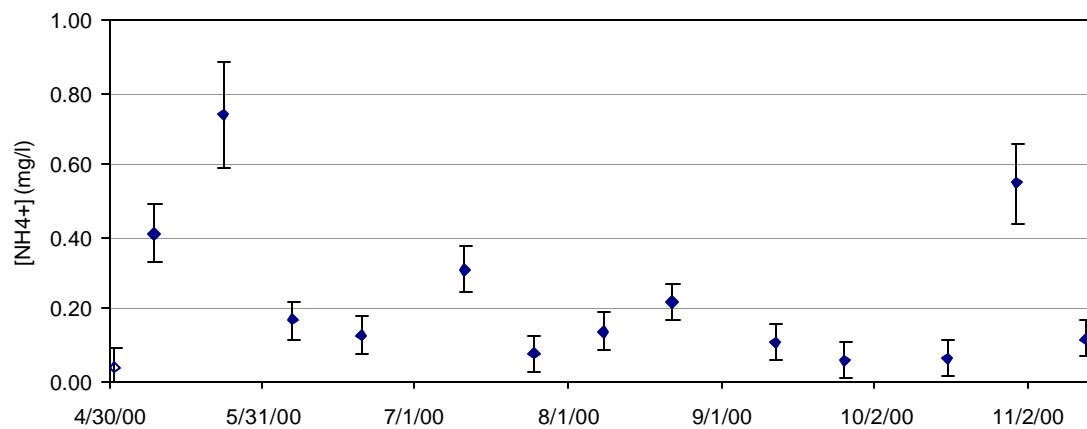


Figure D-1 Tule Lake outlet channel, ammonia concentration, May – November 2000

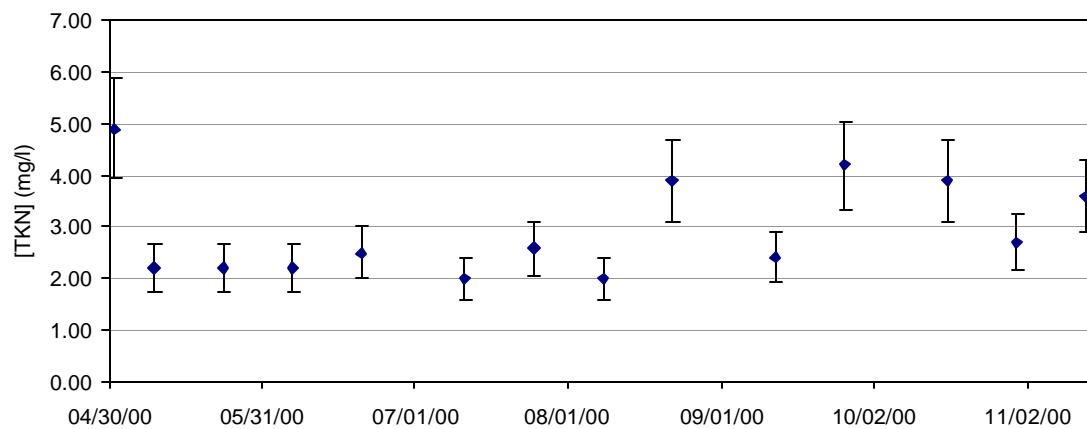


Figure D-2 Tule Lake outlet channel, total Kjeldahl nitrogen concentration, May – November 2000

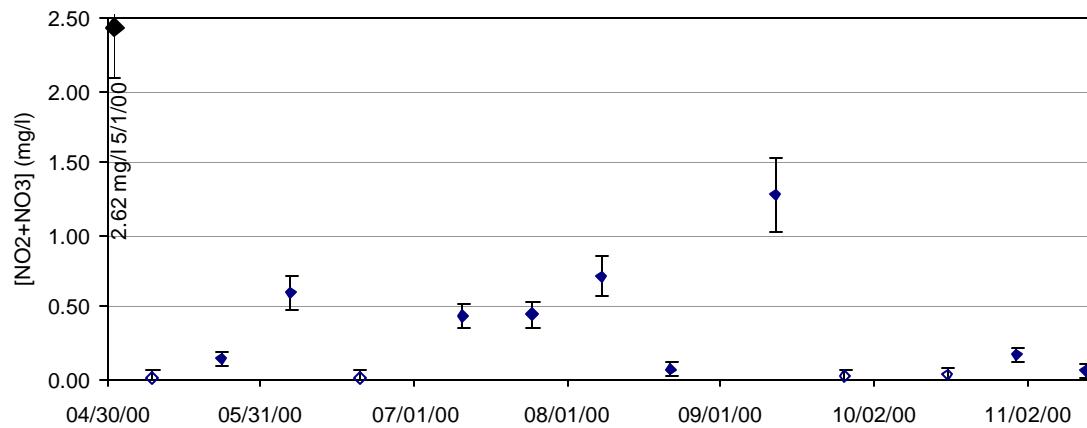


Figure D-3 Tule Lake outlet channel, nitrite plus nitrate concentration, May – November 2000

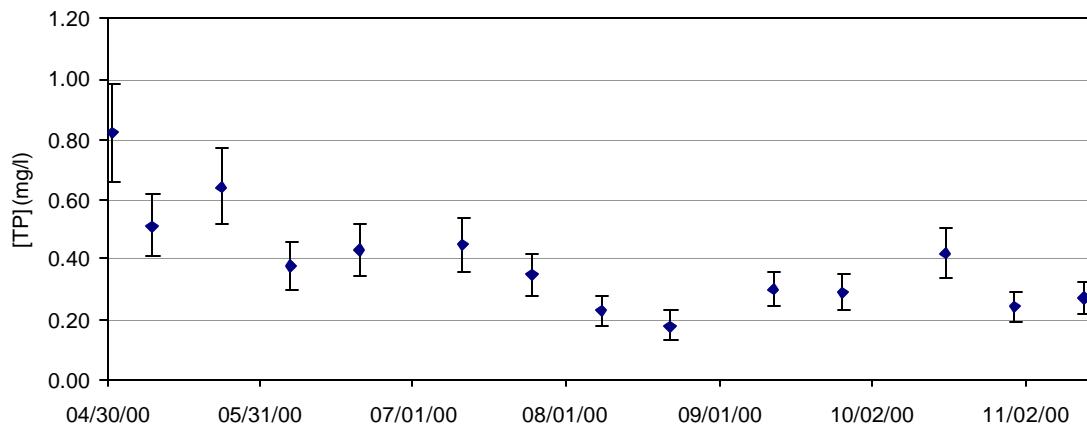


Figure D-4 Tule Lake outlet channel, total phosphorus concentration, May – November 2000

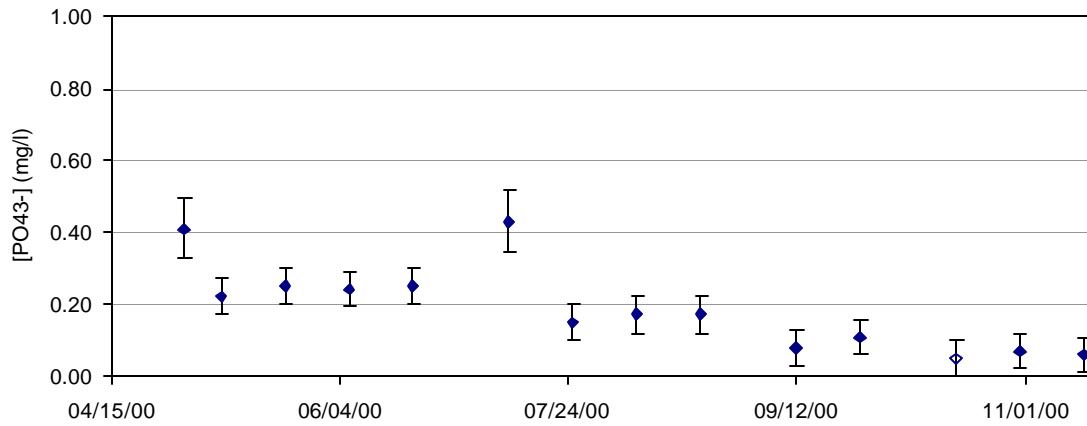


Figure D-5 Tule Lake outlet channel, orthophosphate concentration, May – November 2000

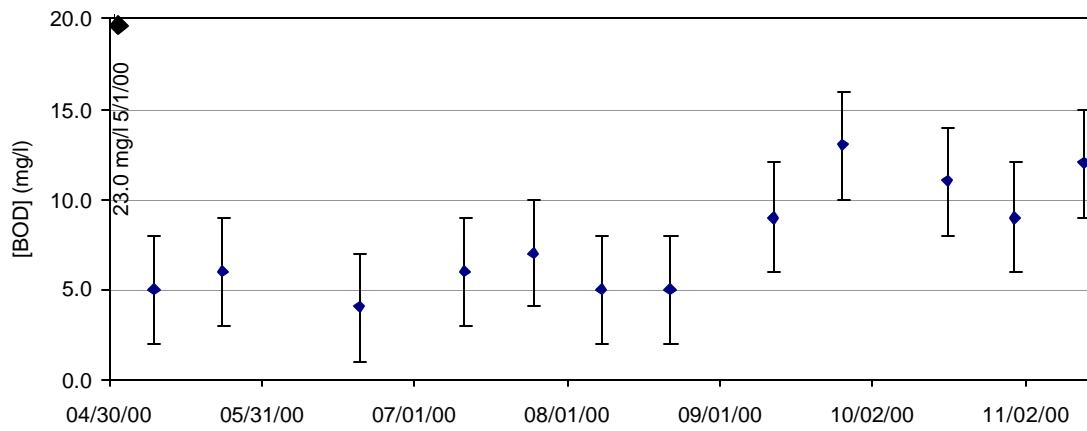


Figure D-6 Tule Lake outlet channel, BOD concentration, May – November 2000

D.2 Klamath Straits Drain at Headworks

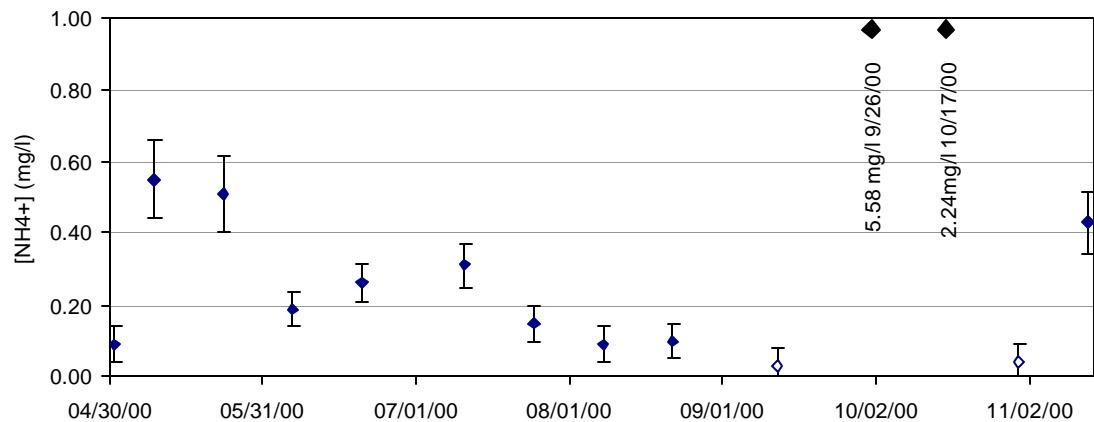


Figure D-7 Figure D-7 Klamath Straits Drain at ammonia, BOD concentration, May – November 2000

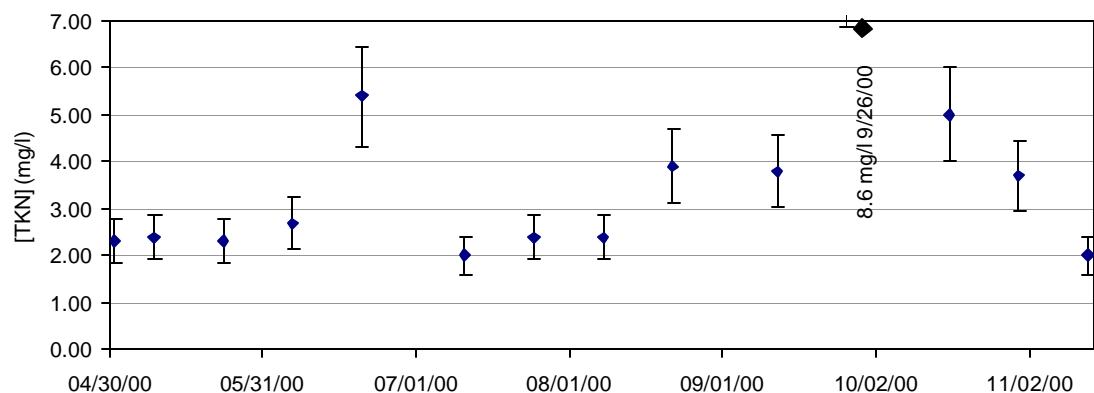


Figure D-9 Klamath Straits Drain at headworks, nitrate plus nitrite concentration, May – November 2000

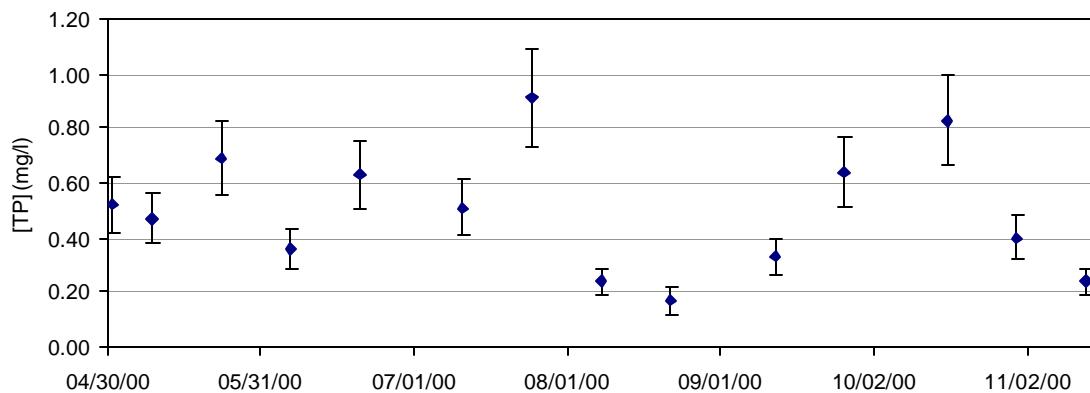


Figure D-10 Klamath Straits Drain at headworks, total phosphorous concentration, May – November 2000

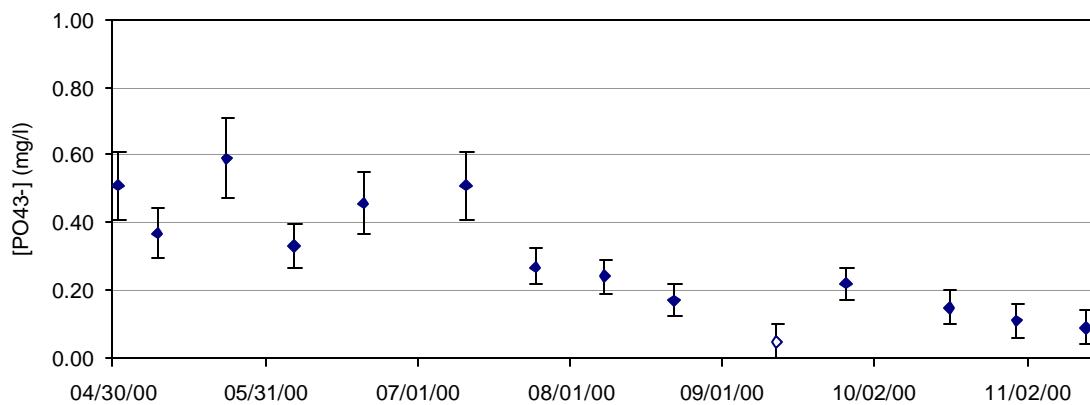


Figure D-12 Klamath Straits Drain at headworks, BOD concentration, May – November 2000

D.3 Klamath Straits Drain at Highway 97

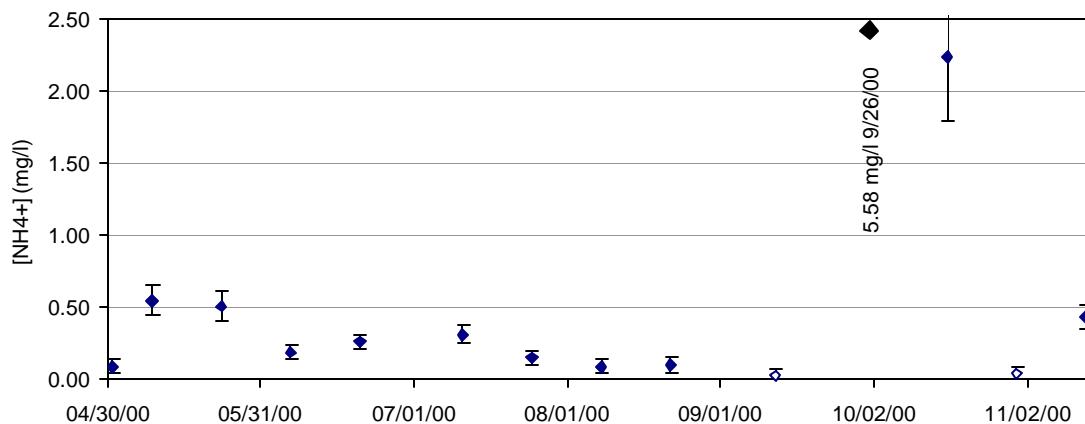


Figure D-13 Klamath Straits Drain at Highway 97, ammonia concentration, May – November 2000

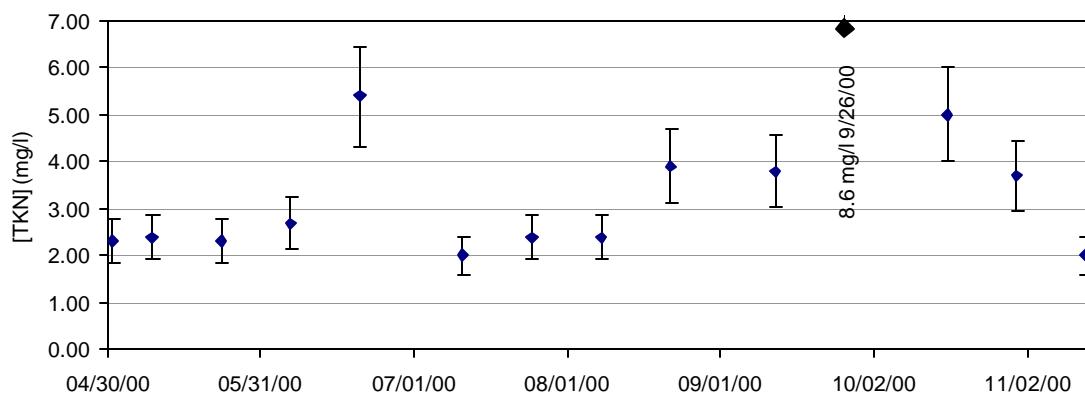
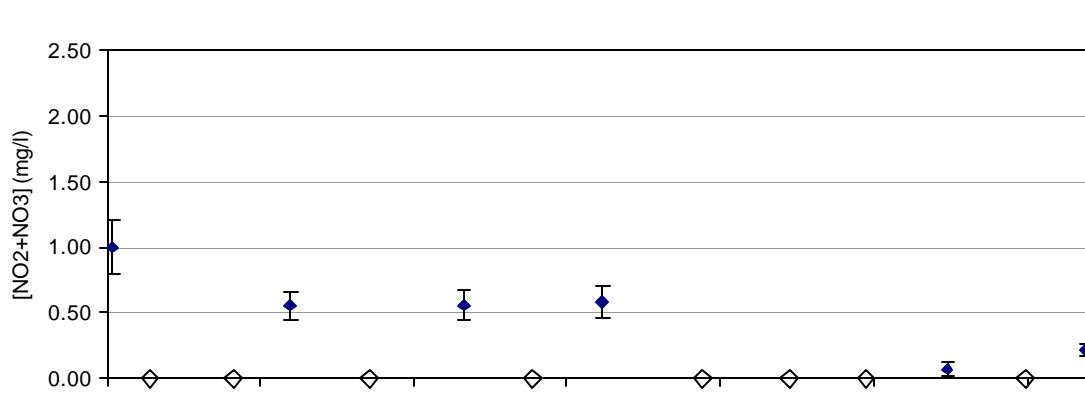


Figure D-14 Klamath Straits Drain at Highway 97, total Kjeldahl nitrogen concentration, May – November 2000



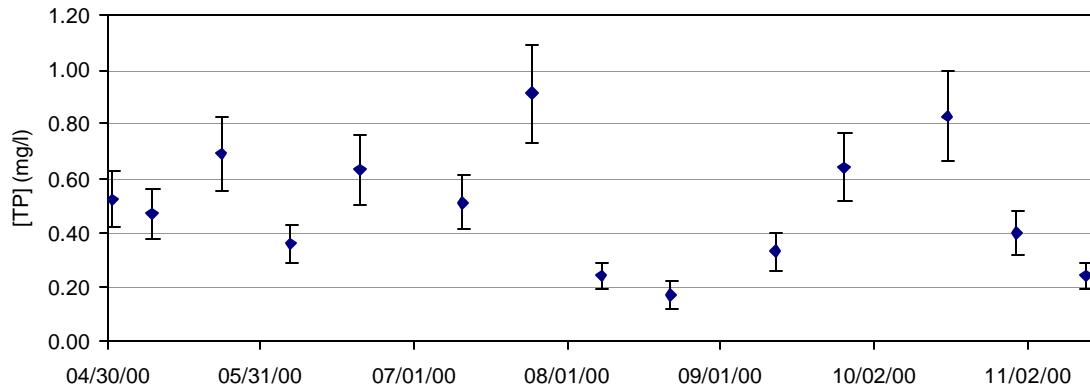


Figure D-16 Klamath Straits Drain at Highway 97, total phosphorous concentration, May – November 2000

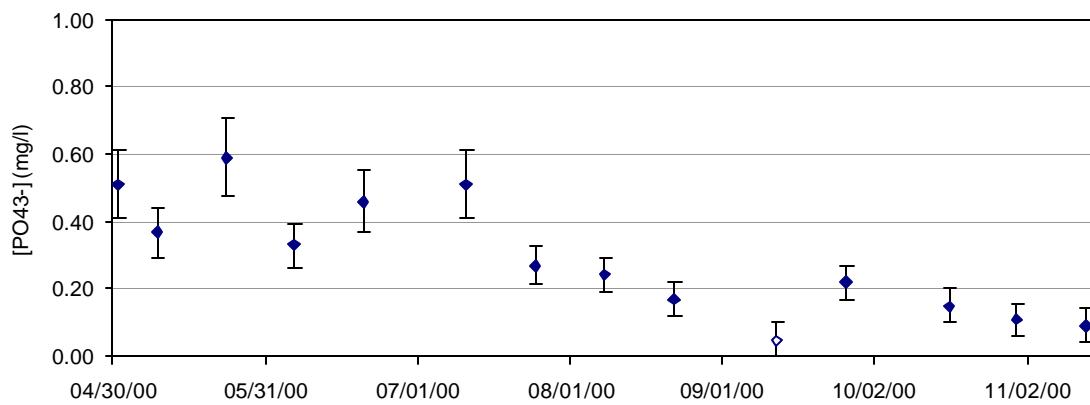
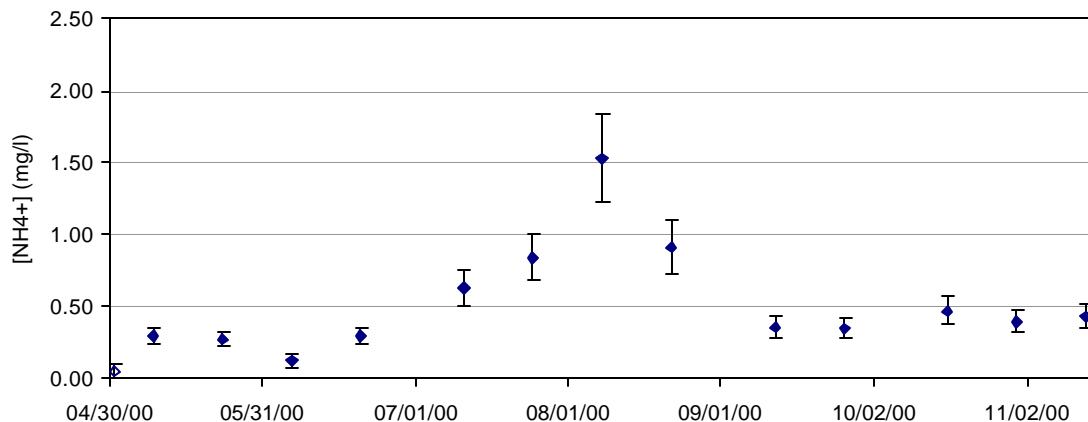


Figure D-18 Klamath Straits Drain at Highway 97, BOD concentration, May – November 2000

D.4 Klamath River at Miller Island



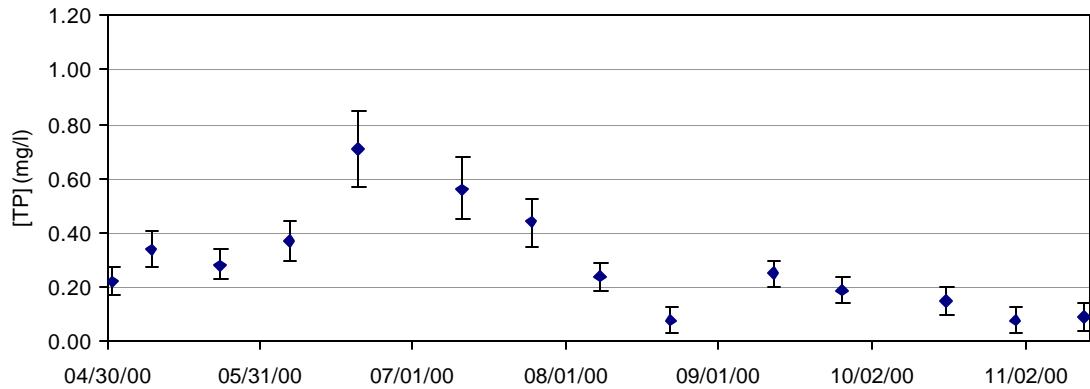


Figure D-22 Klamath River at Miller Island, total phosphorous concentration, May – November 2000

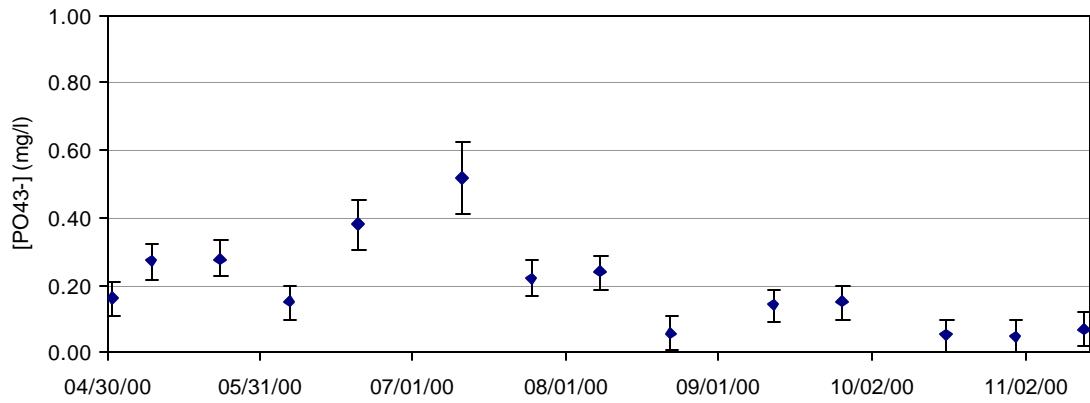


Figure D-23 Klamath River at Miller Island, orthophosphate concentration, May – November 2000

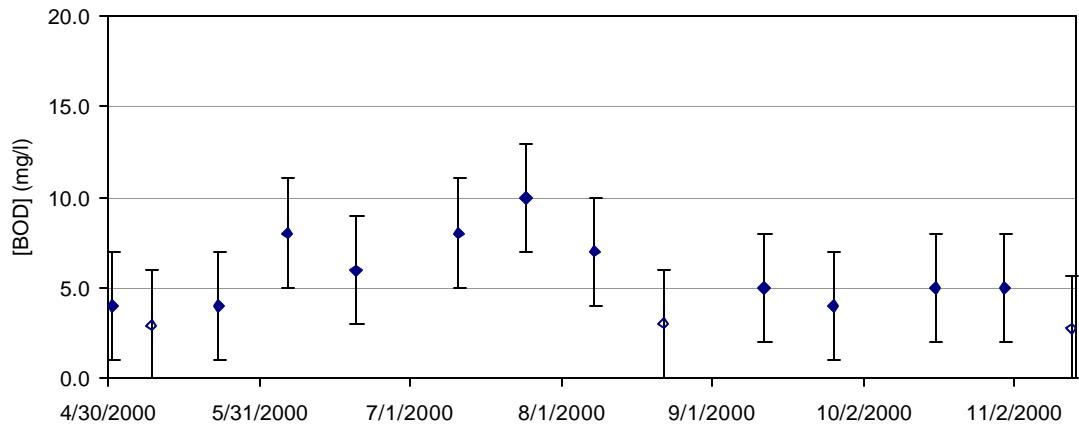


Figure D-24 Klamath River at Miller Island, BOD concentration, May – November 2000

D.5 Klamath River at Keno

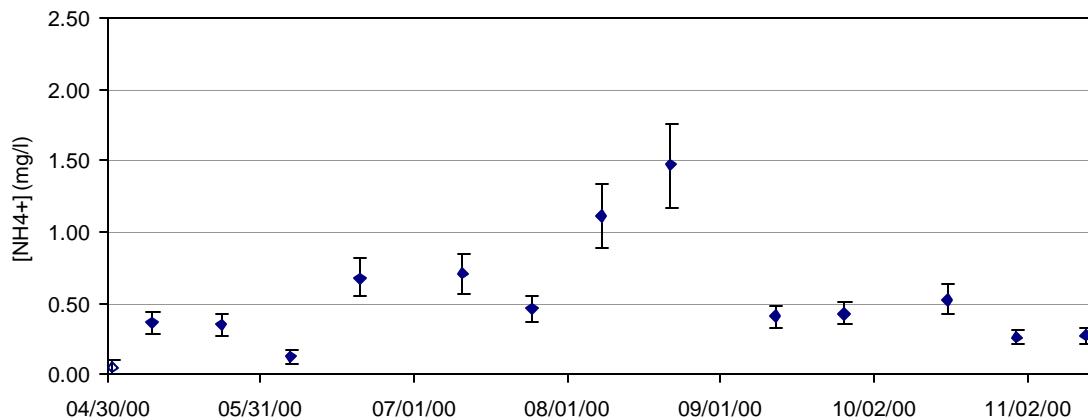


Figure D-25 Klamath River at Keno, ammonia concentration, May – November 2000

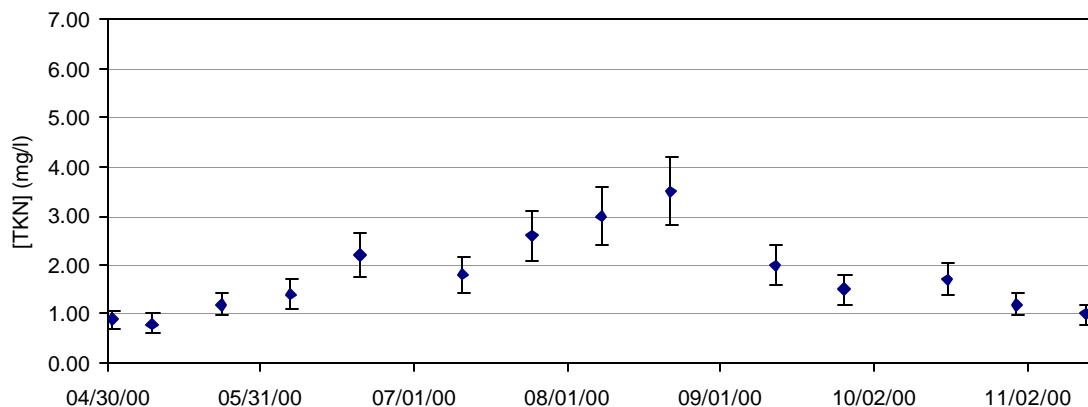


Figure D-26 Klamath River at Keno, total Kjeldahl nitrogen concentration, May – November 2000

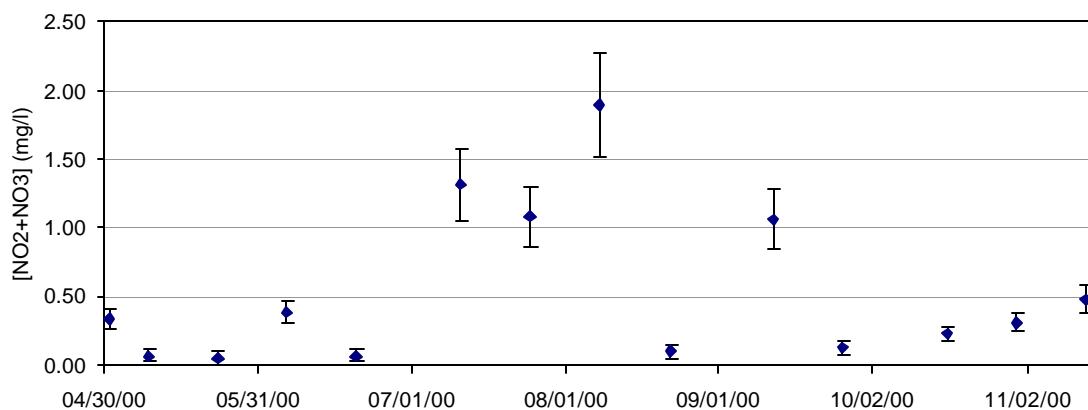


Figure D-27 Klamath River at Keno, nitrite plus nitrate concentration, May – November 2000

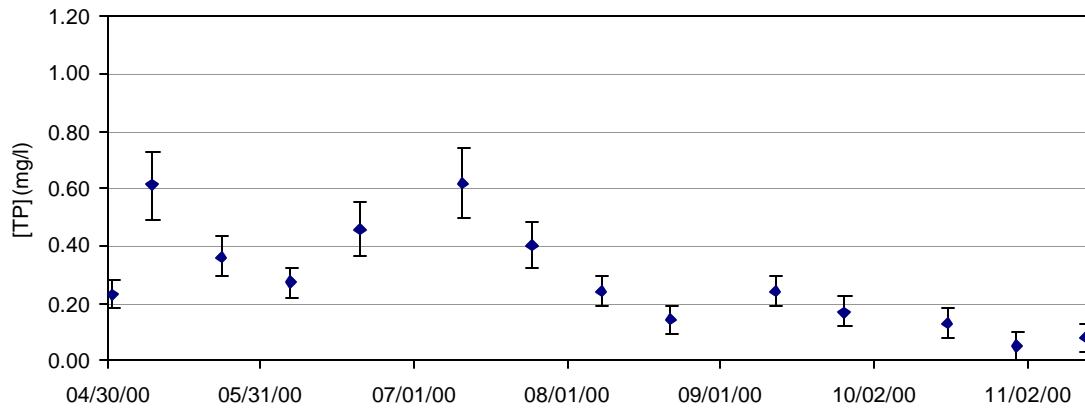


Figure D-28 Klamath River at Keno, total phosphorous concentration, May – November 2000

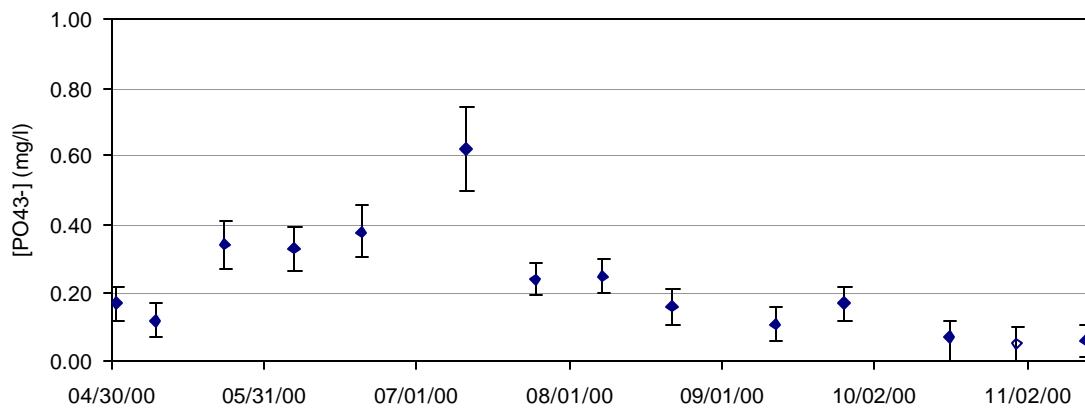


Figure D-29 Klamath River at Keno, orthophosphate concentration, May – November 2000

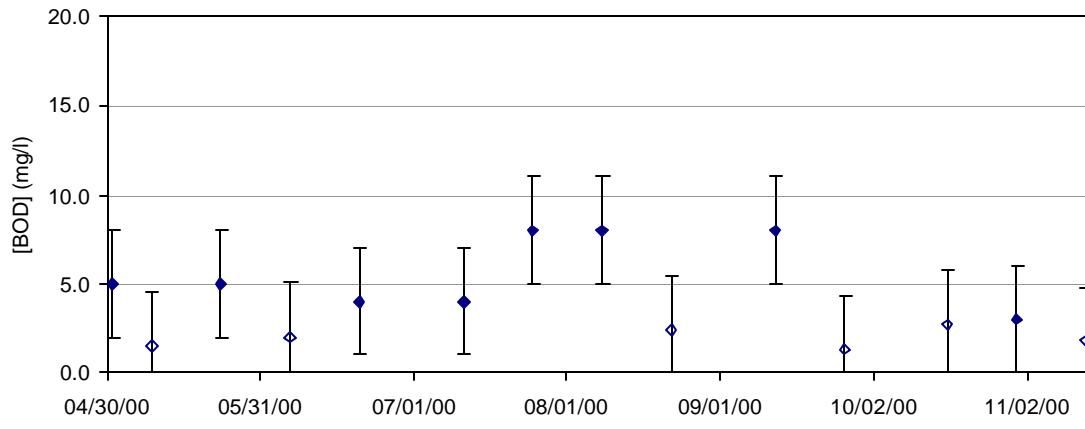


Figure D-30 Klamath River at Keno, BOD concentration, May – November 2000

D.6 Klamath River above Copco Reservoir

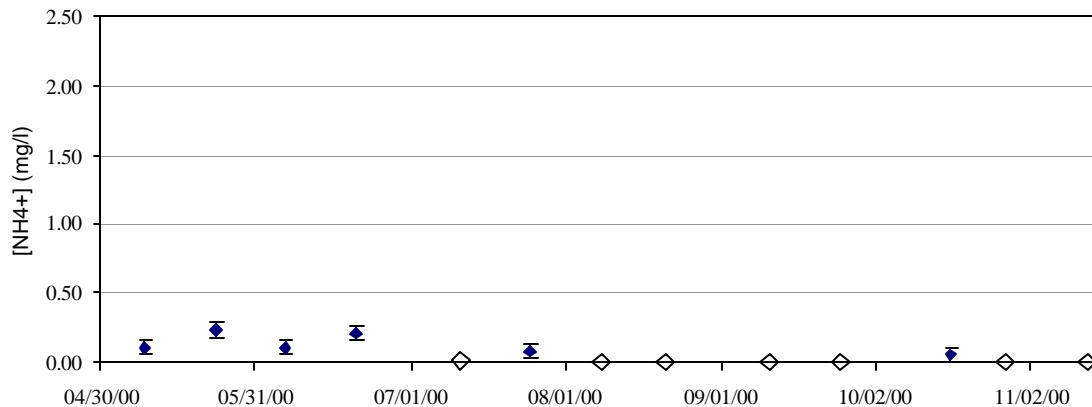


Figure D-31 Klamath River above Copco Reservoir, ammonia concentration, May – November 2000

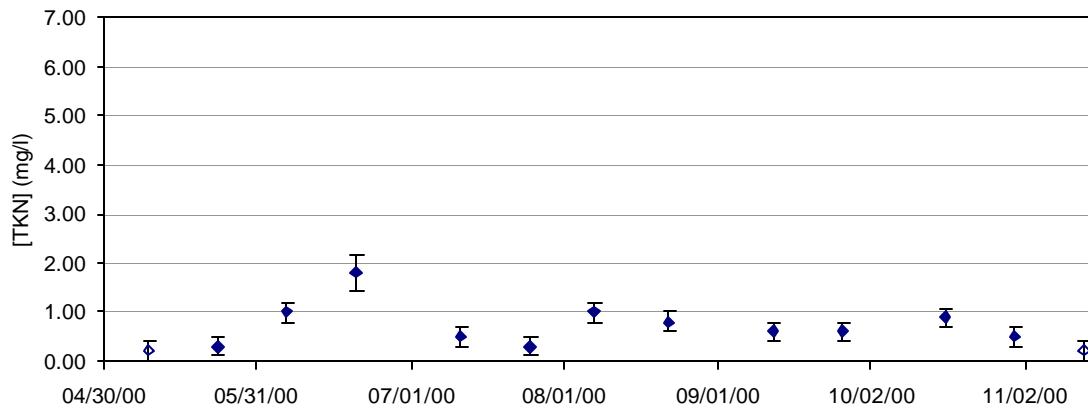


Figure D-32 Klamath River above Copco Reservoir, total Kjeldahl nitrogen concentration, May – November 2000

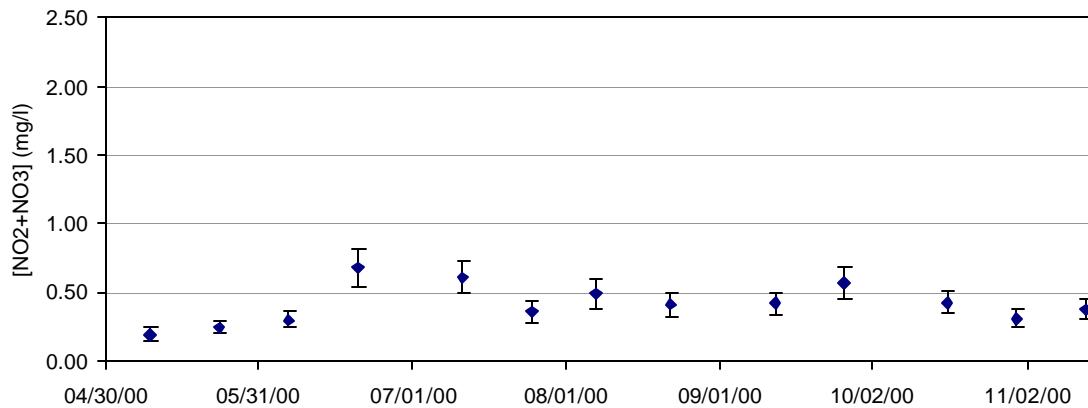


Figure D-33 Klamath River above Copco Reservoir, nitrite plus nitrate concentration, May – November 2000

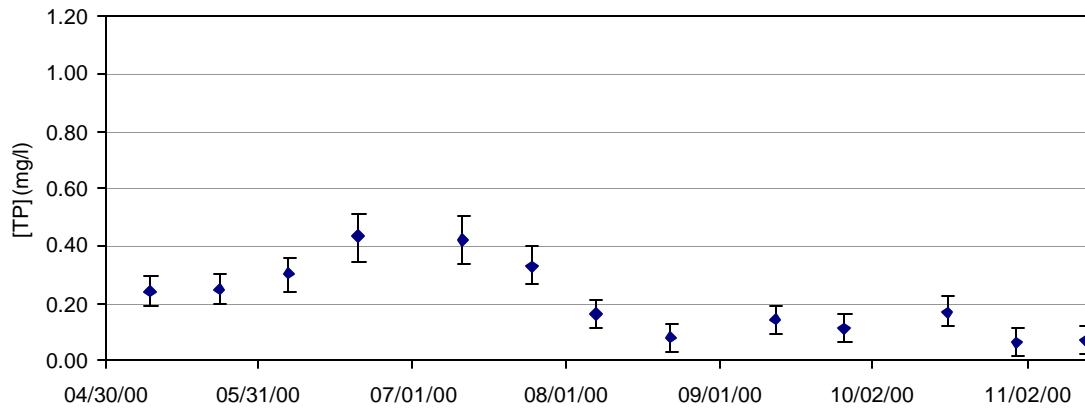


Figure D-34 Klamath River above Copco Reservoir, total phosphorous concentration, May – November 2000

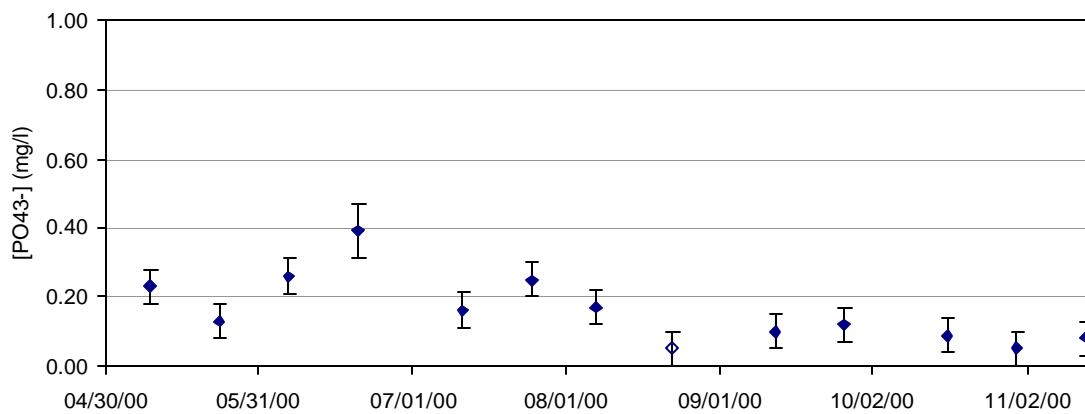


Figure D-36 Klamath River above Copco Reservoir, BOD concentration, May – November 2000

D.7 Klamath River below Iron Gate Reservoir

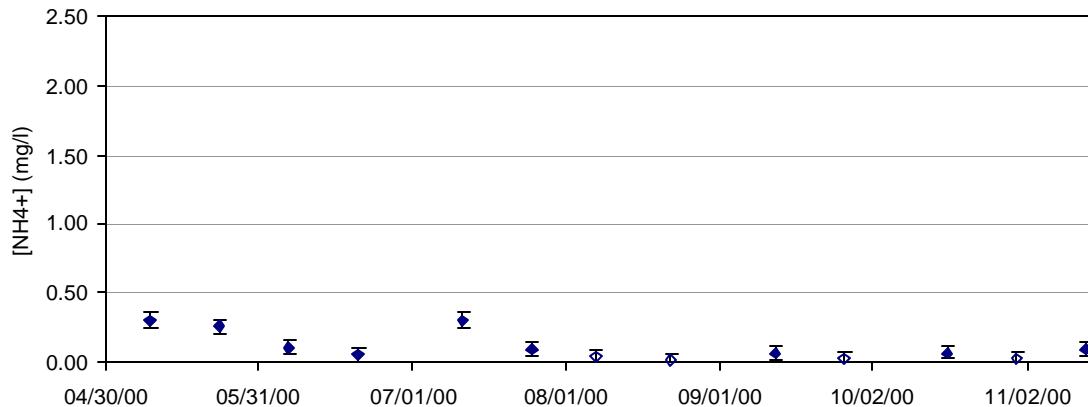


Figure D-37 Klamath River below Iron Gate Reservoir, ammonia concentration, May – November 2000

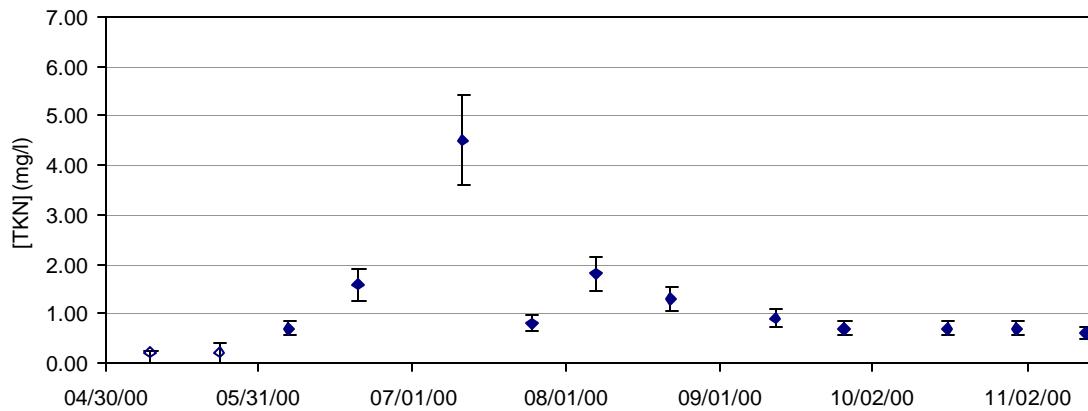


Figure D-38 Klamath River below Iron Gate Reservoir, total Kjeldahl nitrogen concentration, May – November 2000

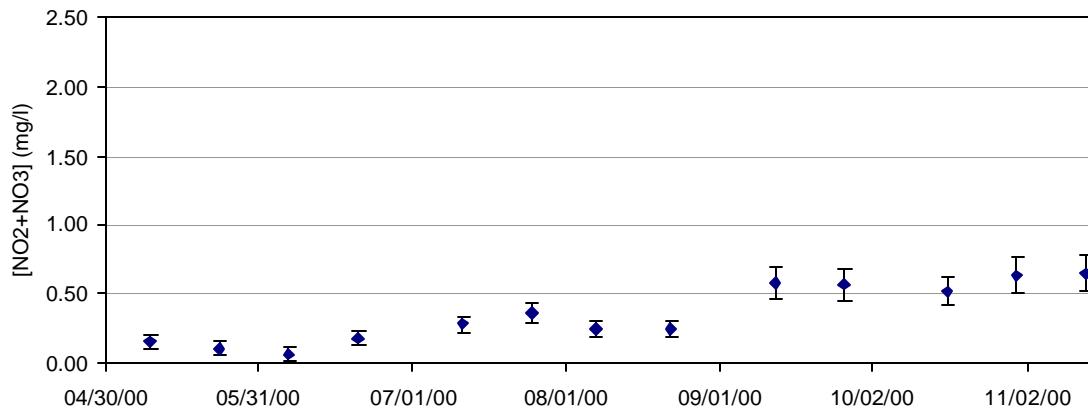


Figure D-39 Klamath River below Iron Gate Reservoir, nitrite plus nitrate concentration, May – November 2000

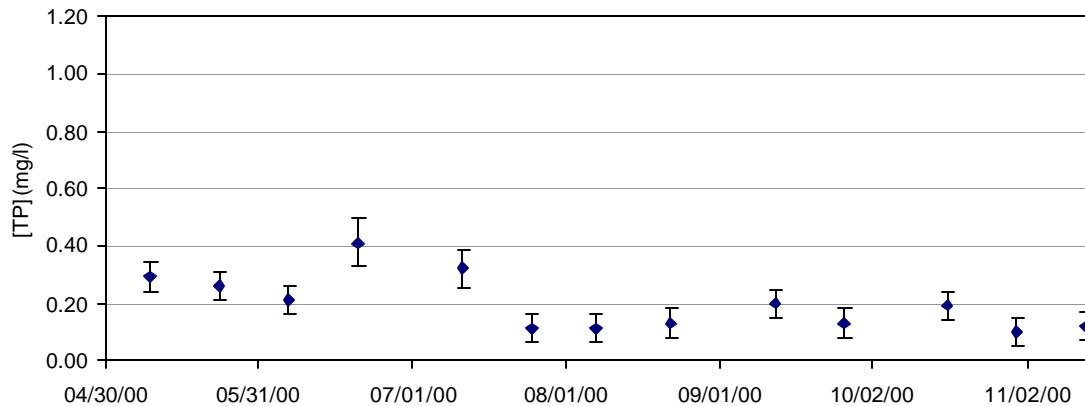


Figure D-40 Klamath River below Iron Gate Reservoir, total phosphorous concentration, May – November 2000

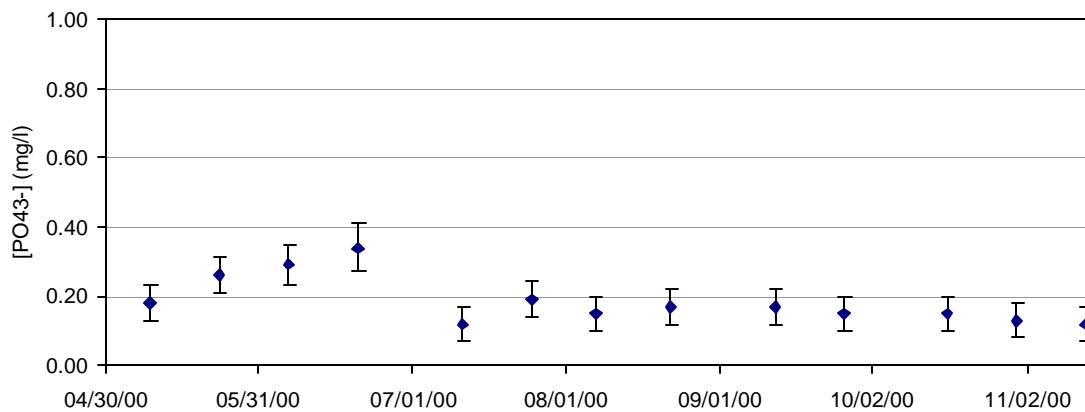


Figure D-41 Klamath River below Iron Gate Reservoir, orthophosphate concentration, May – November 2000

[all values at or below the reporting limit of 3 mg/l]

Figure D-42 Klamath River below Iron Gate Reservoir, BOD concentration, May – November 2000

D.8 Klamath River near Seiad Valley

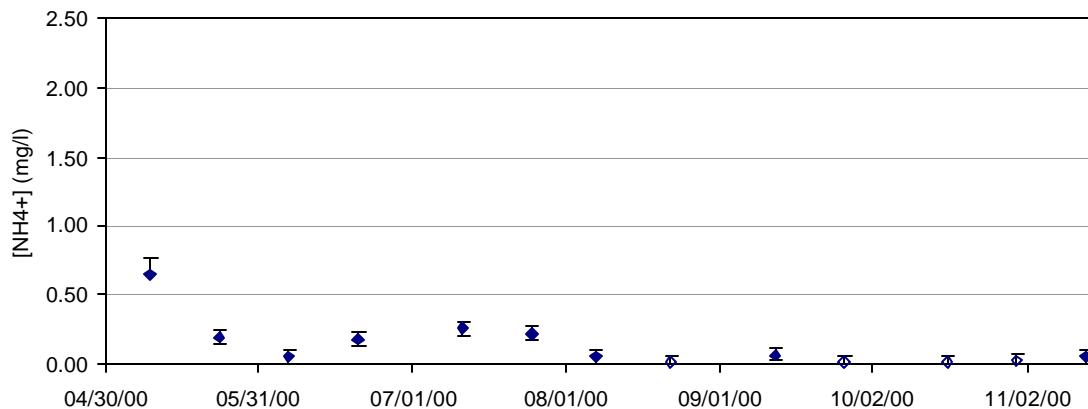


Figure D-43 Klamath River near Seiad Valley, ammonia concentration, May – November 2000

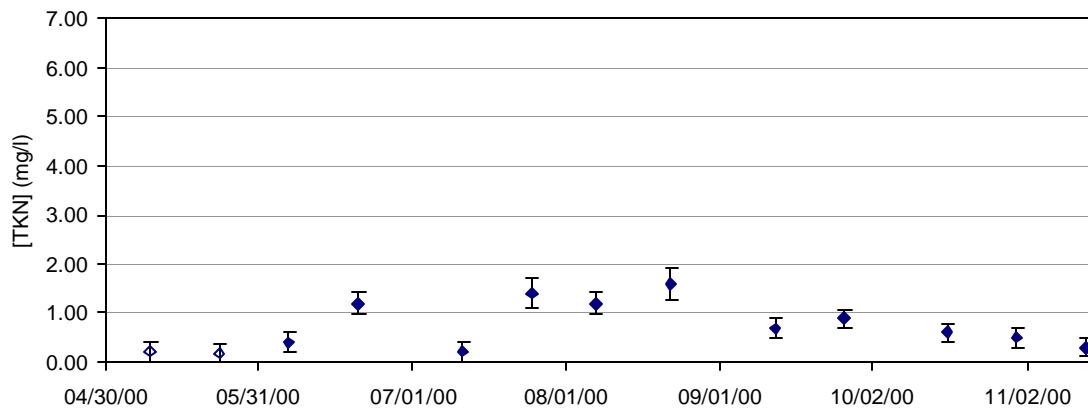


Figure D-44 Klamath River near Seiad Valley, total Kjeldahl nitrogen concentration, May – November 2000

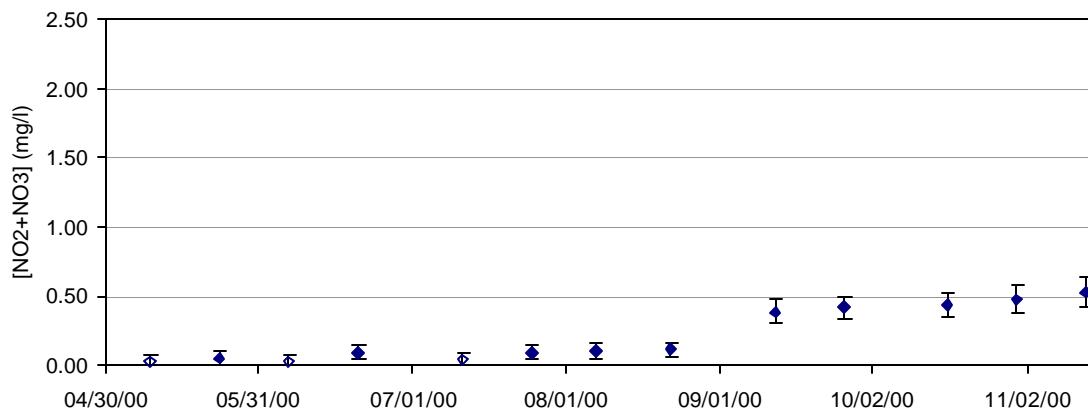


Figure D-45 Klamath River near Seiad Valley, nitrite plus nitrate concentration, May – November 2000

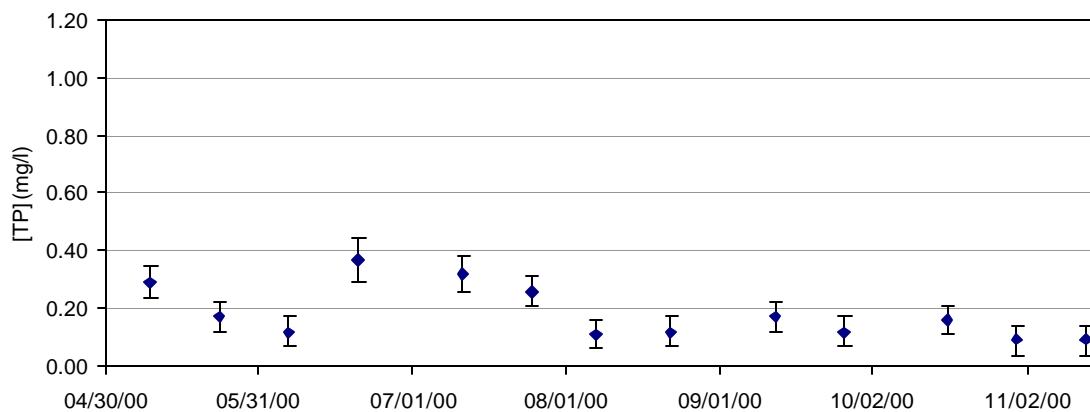
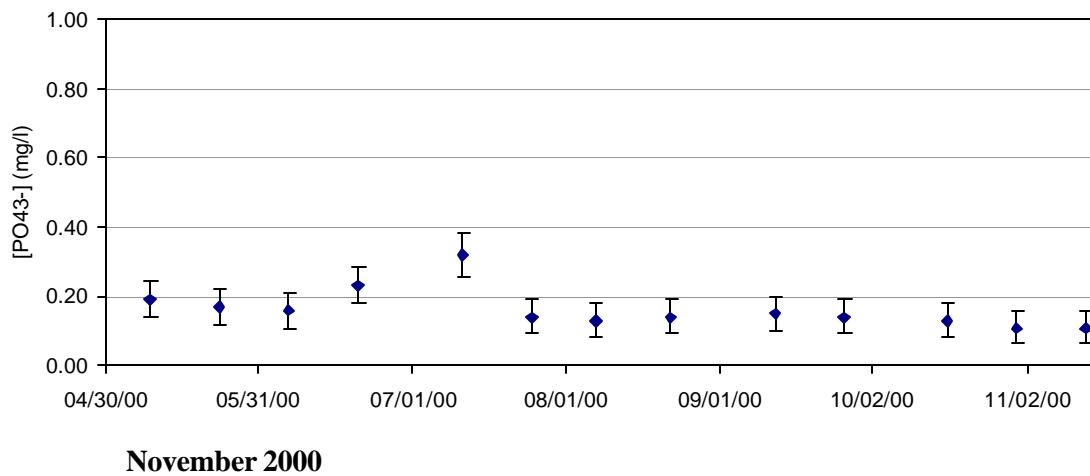


Figure D-46 Klamath River near Seiad Valley, total phosphorous concentration, May – November 2000

Figure D-47 Klamath River near Seiad Valley, orthophosphate concentration, May –



November 2000

[all values at or below the reporting limit of 3 mg/l]

Figure D-48 Klamath River near Seiad Valley, BOD concentration, May – November 2000

D.9 Shasta River (RM 1.0)

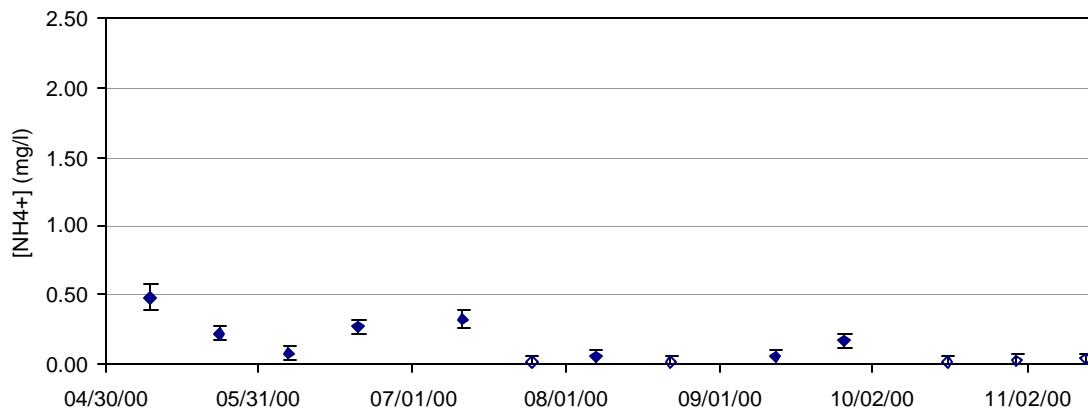


Figure D-49 Shasta River (RM 1.0), ammonia concentration, May – November 2000

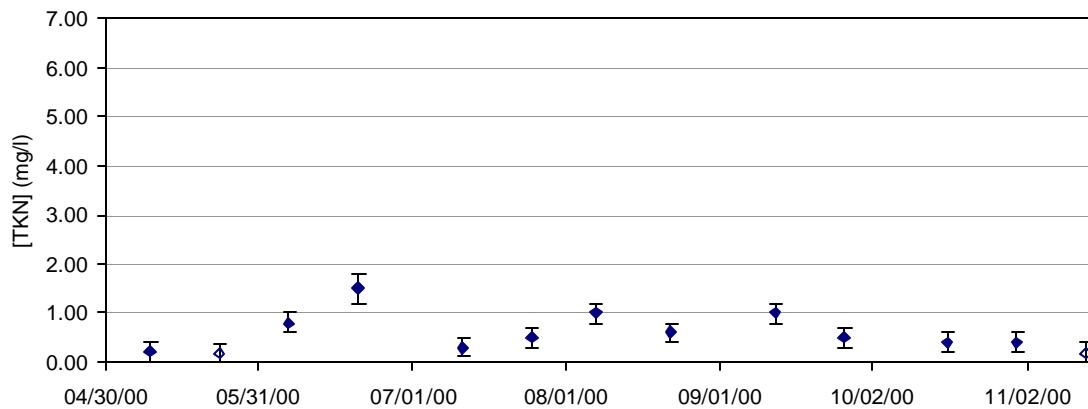


Figure D-50 Shasta River (RM 1.0), total Kjeldahl nitrogen concentration, May – November 2000

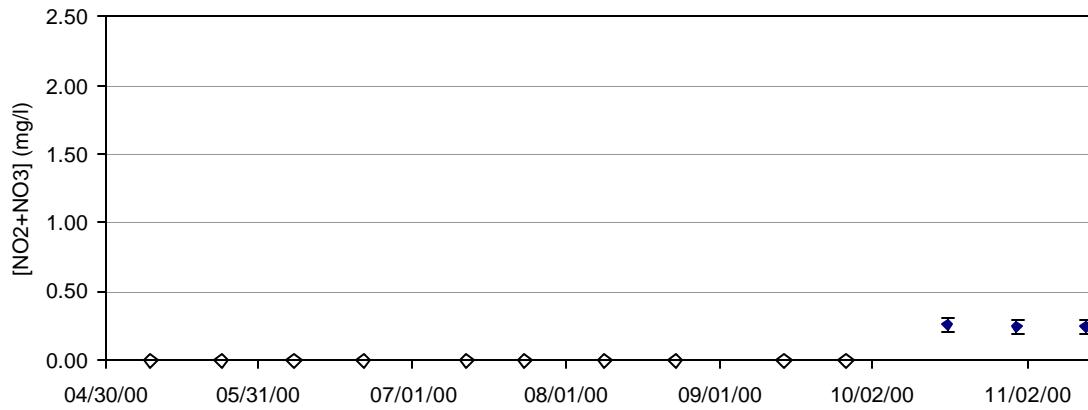


Figure D-51 Shasta River (RM 1.0), nitrite plus nitrate concentration, May – November 2000

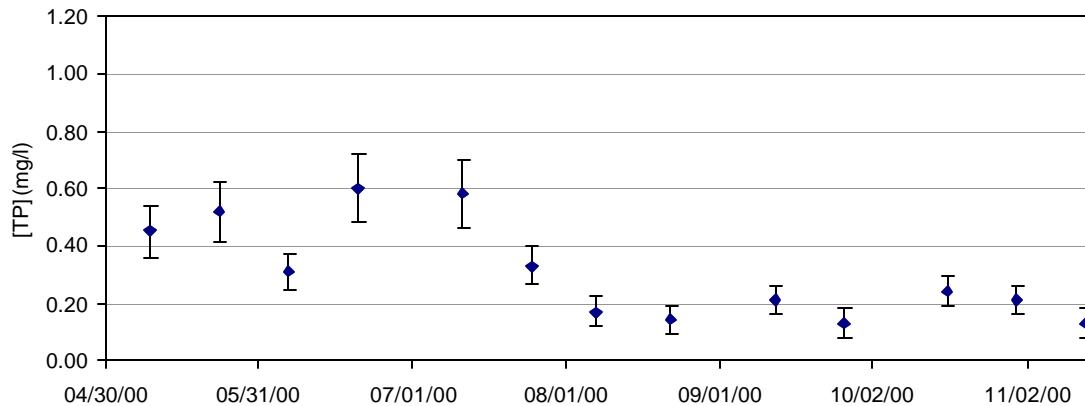


Figure D-52 Shasta River (RM 1.0), total phosphorous concentration, May – November 2000

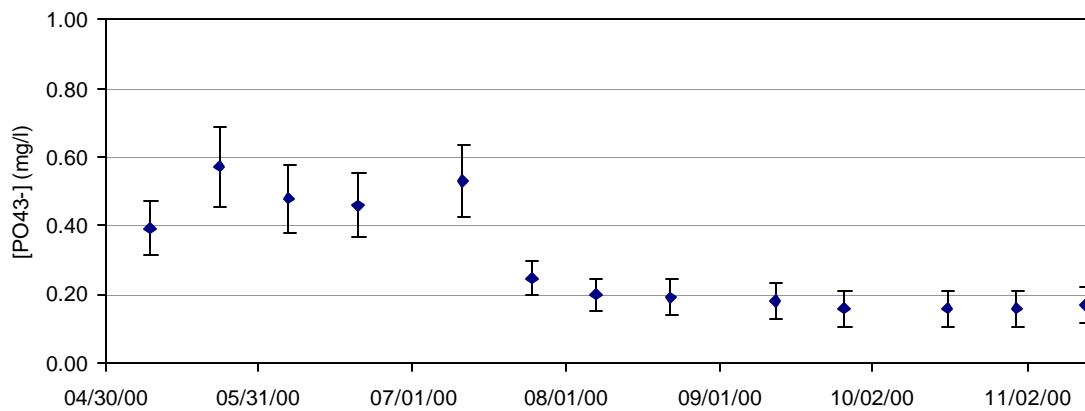


Figure D-53 Shasta River (RM 1.0), orthophosphate concentration, May – November 2000

[all values at or below the reporting limit of 3 mg/l]

Figure D-54 Shasta River (RM 1.0), BOD concentration, May – November 2000

D.10 Scott River near Ft. Jones (RM 23.4)

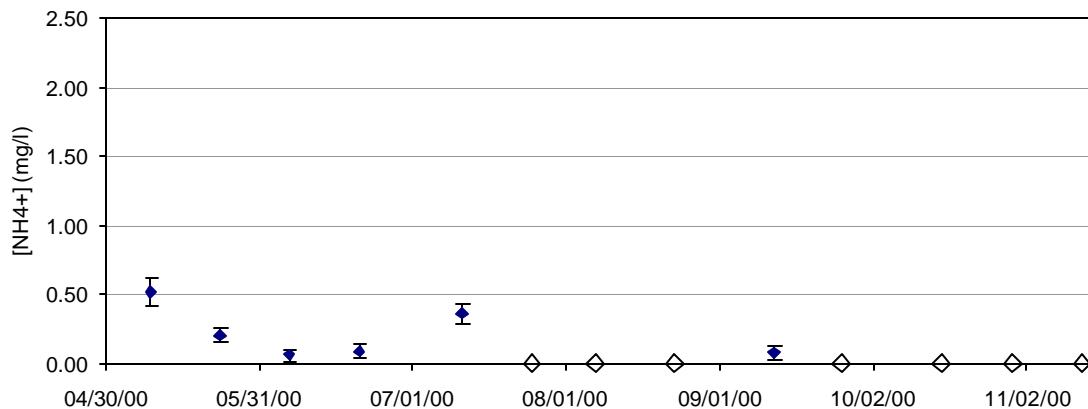


Figure D-55 Scott River near Ft. Jones (RM 23.4), ammonia concentration, May – November 2000

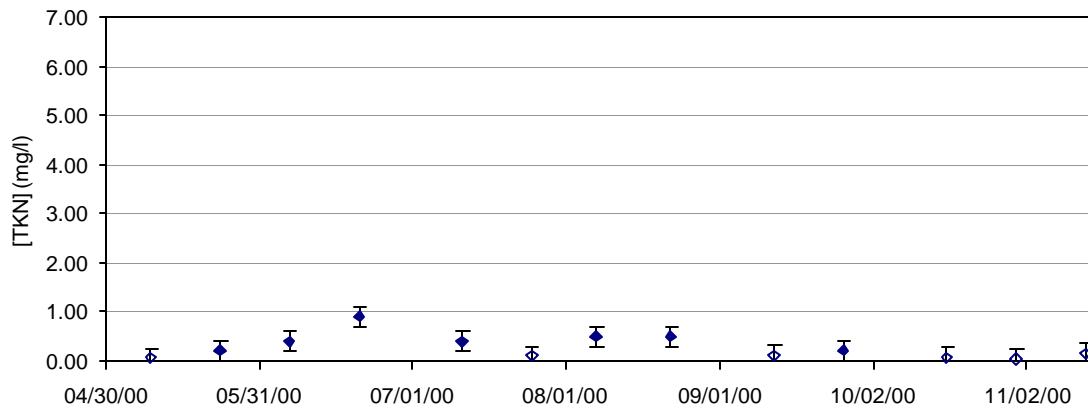


Figure D-56 Scott River near Ft. Jones (RM 23.4), total Kjeldahl nitrogen concentration, May – November 2000

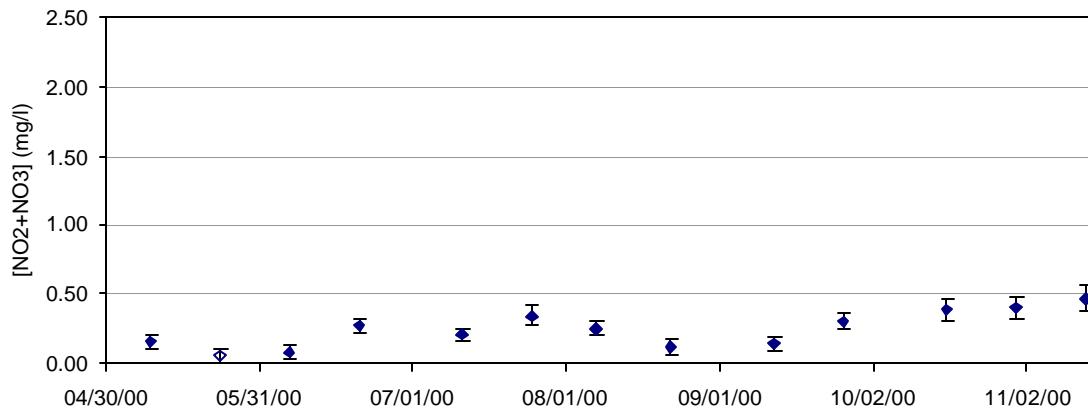


Figure D-57 Scott River near Ft. Jones (RM 23.4), nitrite plus nitrate concentration, May – November 2000

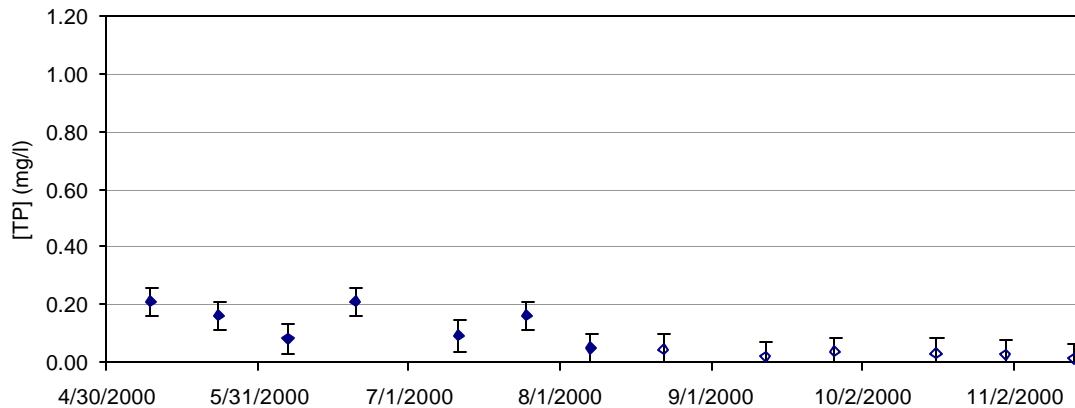


Figure D-58 Scott River near Ft. Jones (RM 23.4), total phosphorous concentration, May – November 2000

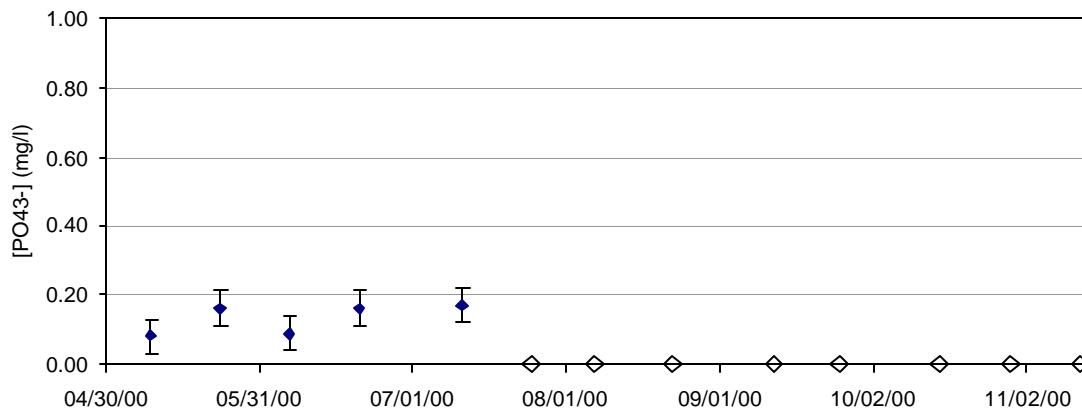


Figure D-59 Scott River near Ft. Jones (RM 23.4), orthophosphate concentration, May – November 2000

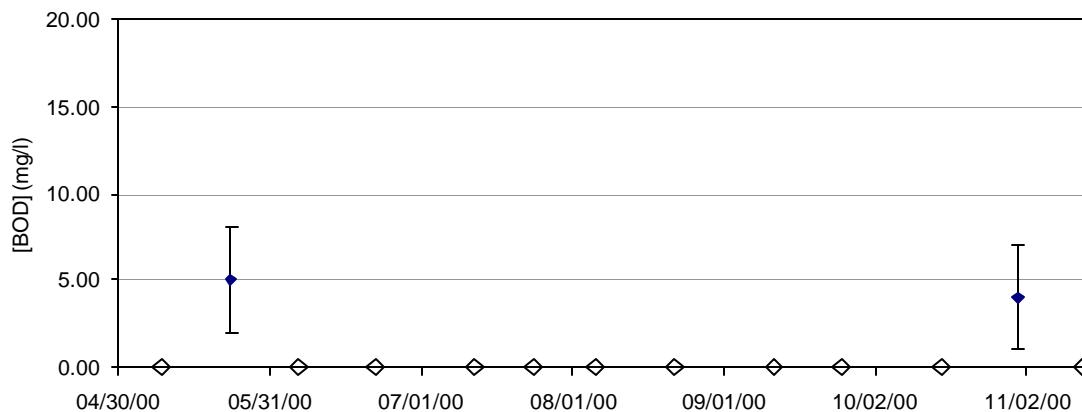


Figure D-60 Scott River near Ft. Jones (RM 23.4), BOD concentration, May – November 2000

E SEMI-MONTHLY DATA: PROBABILITY PLOTS BY SITE

E.1 Tule Lake Outlet Tunnel

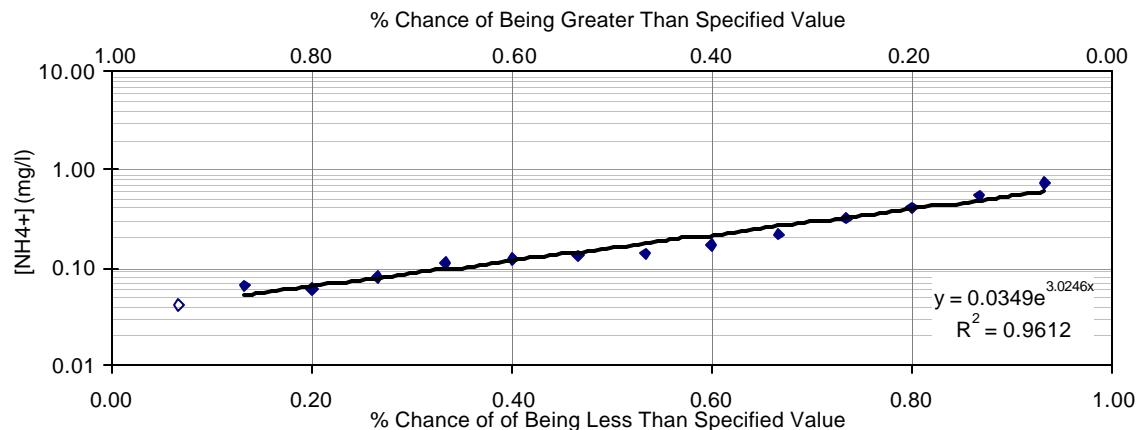


Figure E-1 Tule Lake Outlet Tunnel, probability plot for ammonia, May – November 2000

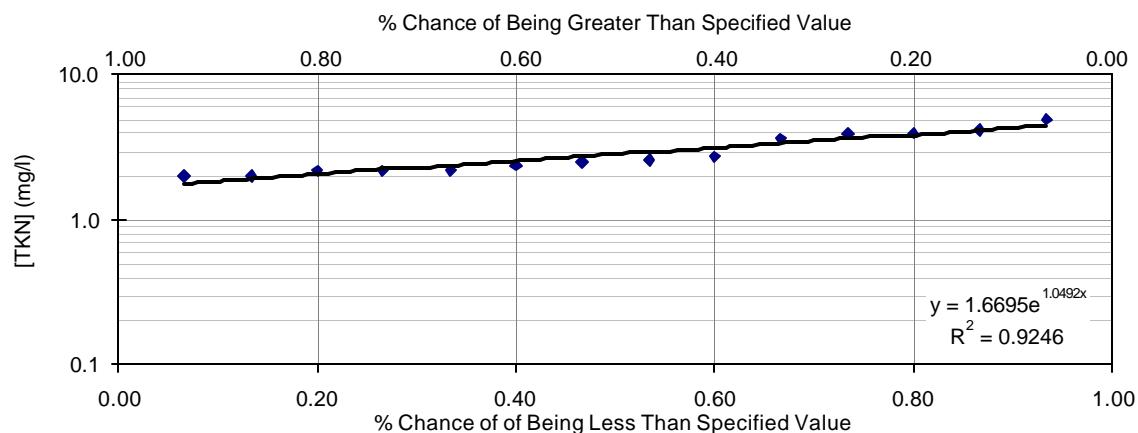
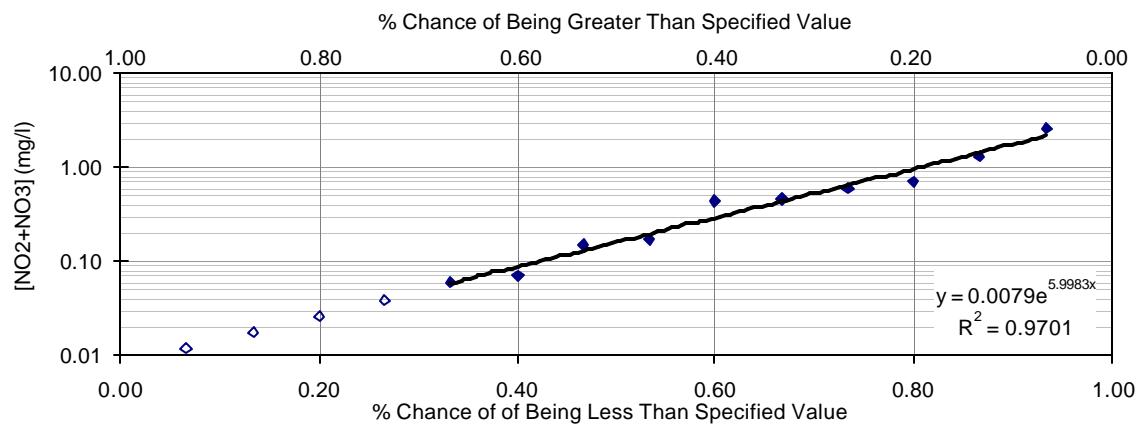


Figure E-2 Tule Lake Outlet Tunnel, probability plot for total Kjeldahl nitrogen, May –



November 2000

Figure E-3 Tule Lake Outlet Tunnel, probability plot for nitrite plus nitrate, May – November 2000

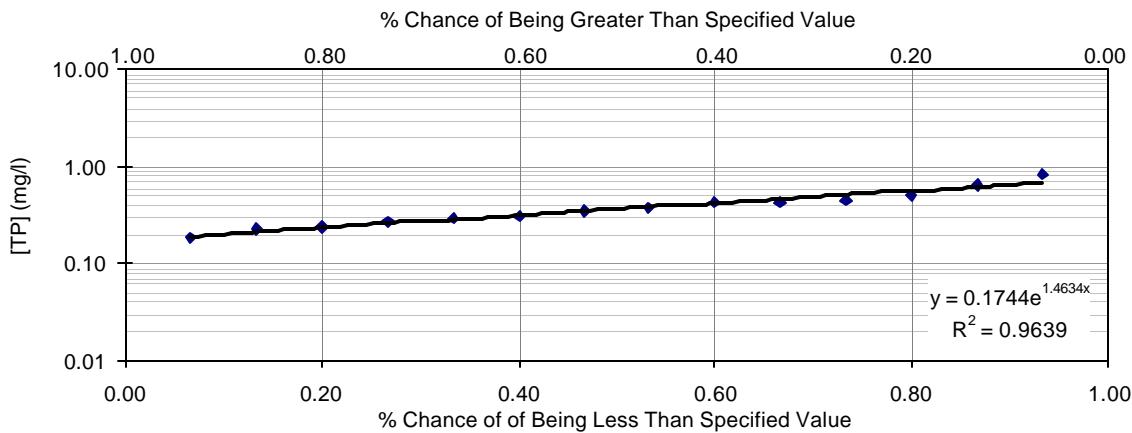


Figure E-4 Tule Lake Outlet Tunnel, probability plot for total phosphorous, May – November 2000

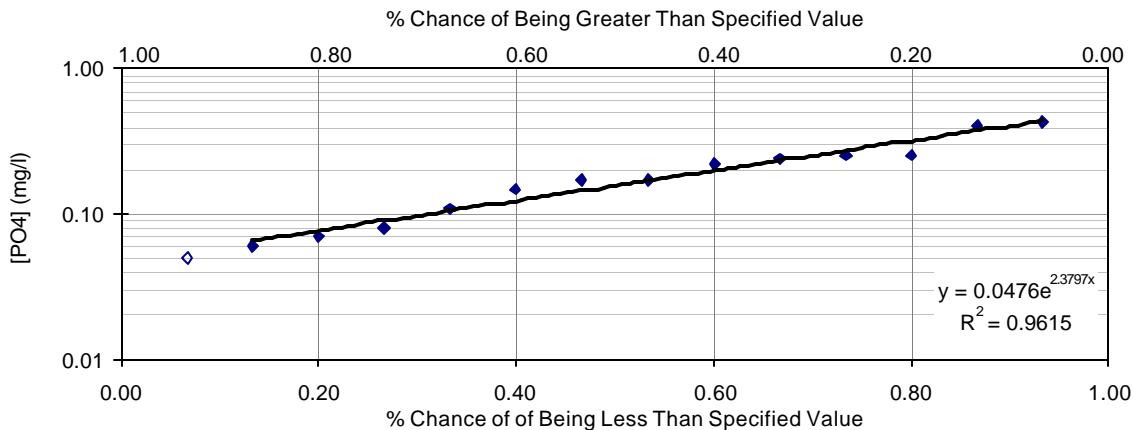


Figure E-5 Tule Lake Outlet Tunnel, probability plot for orthophosphate, May – November 2000

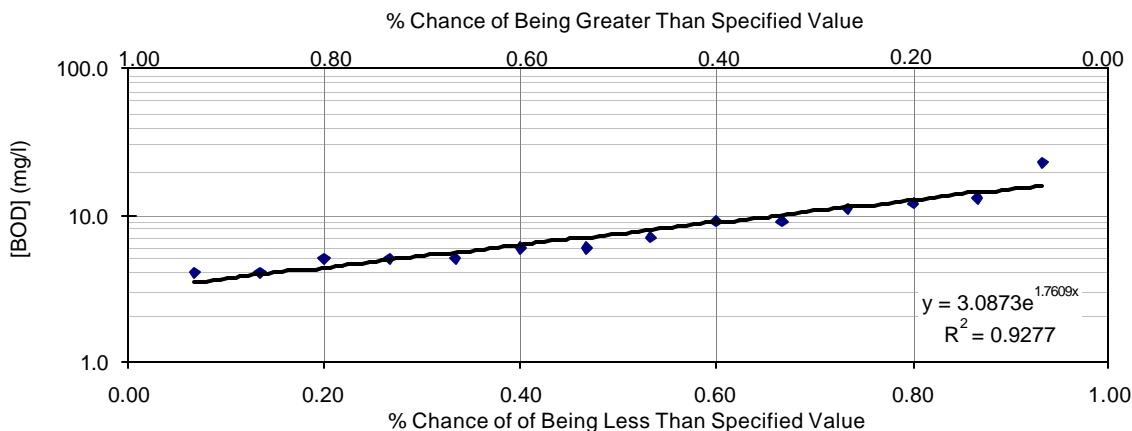


Figure E-6 Tule Lake Outlet Tunnel, probability plot for BOD, May – November 2000

E.2 Klamath Straits Drain at Headworks

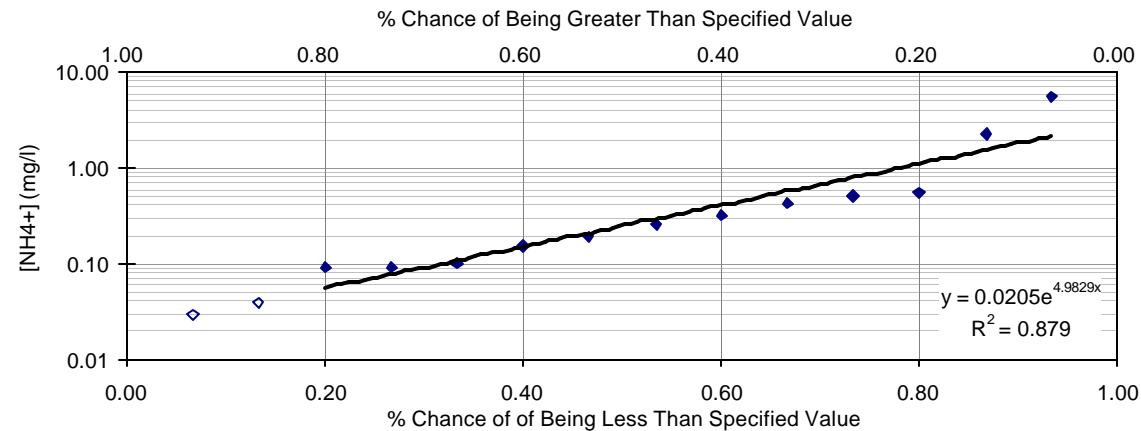


Figure E-7 Klamath Straits Drain at headworks, probability plot for ammonia, May – November 2000

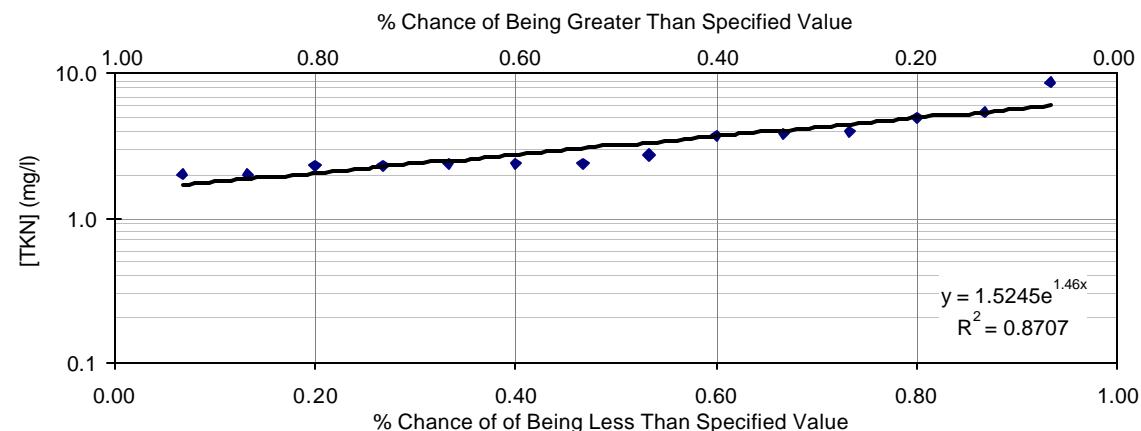


Figure E-8 Klamath Straits Drain at headworks, probability plot for total Kjeldahl nitrogen, May – November 2000

[Insufficient data]

Figure E-9 Klamath Straits Drain at headworks, probability plot for nitrite plus nitrate, May – November 2000

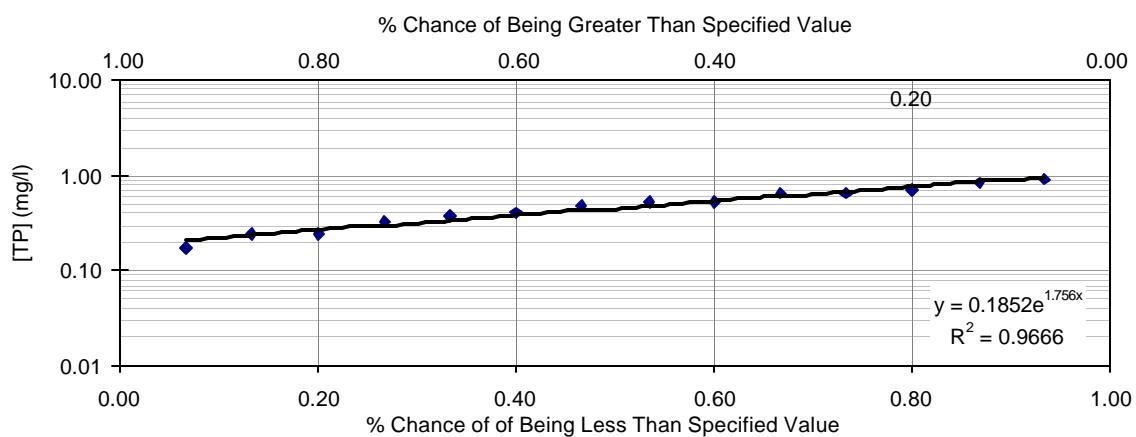


Figure E-10 Klamath Straits Drain at headworks, probability plot for total phosphorous, May – November 2000

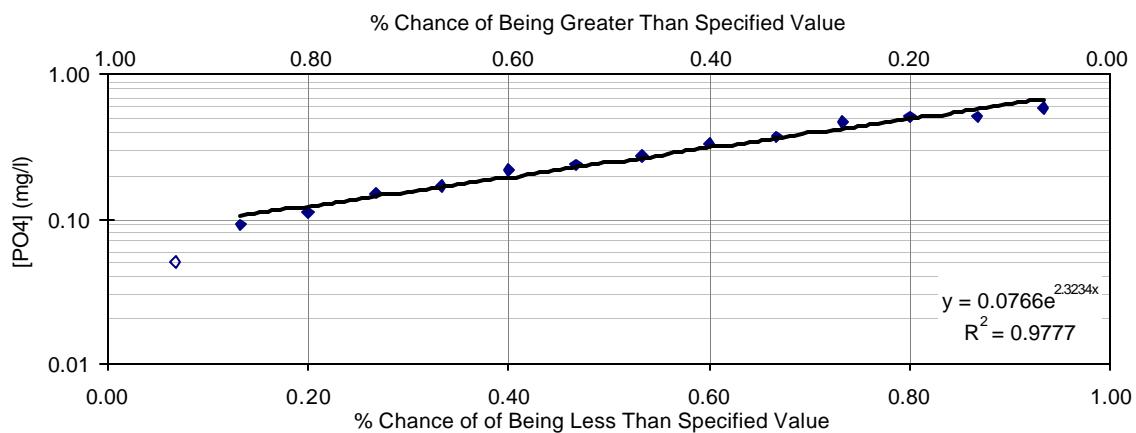


Figure E-11 Klamath Straits Drain at headworks, probability plot for orthophosphate, May – November 2000

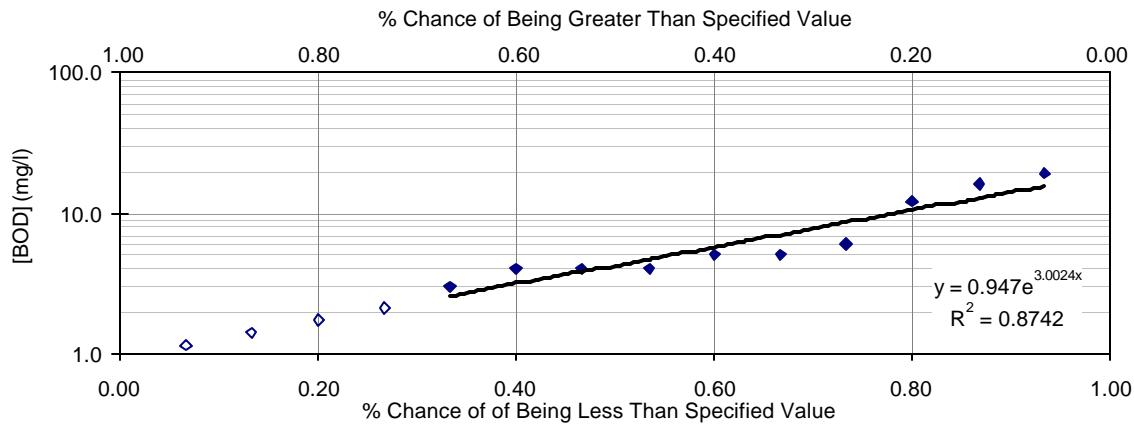


Figure E-12 Klamath Straits Drain at headworks, probability plot for BOD, May – November 2000

E.3 Klamath Straits Drain at Highway 97

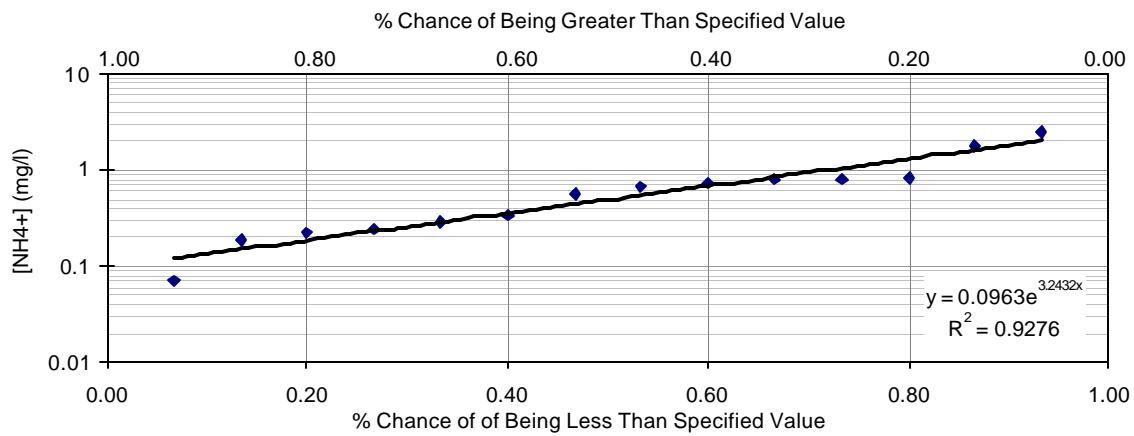


Figure E-13 Klamath Straits Drain at Highway 97, probability plot for ammonia, May – November 2000

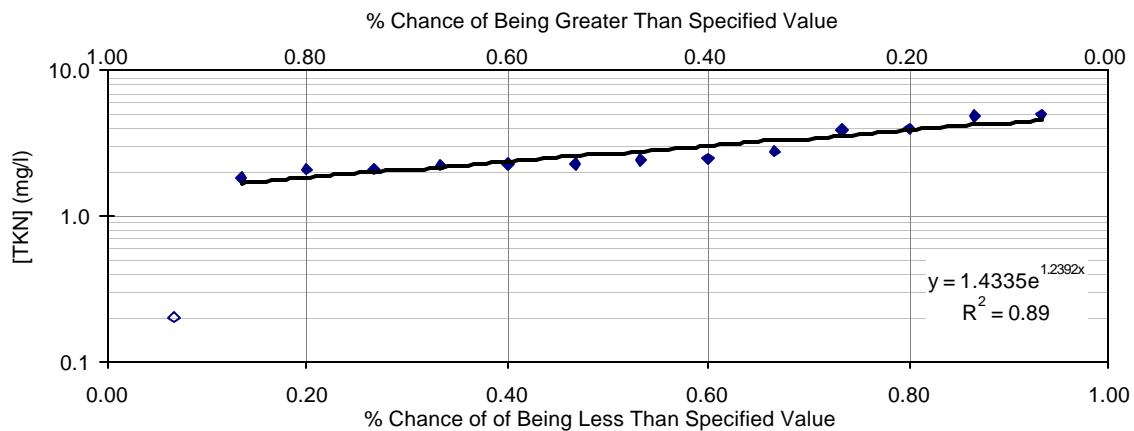


Figure E-14 Klamath Straits Drain at Highway 97, probability plot for total Kjeldahl nitrogen, May – November 2000

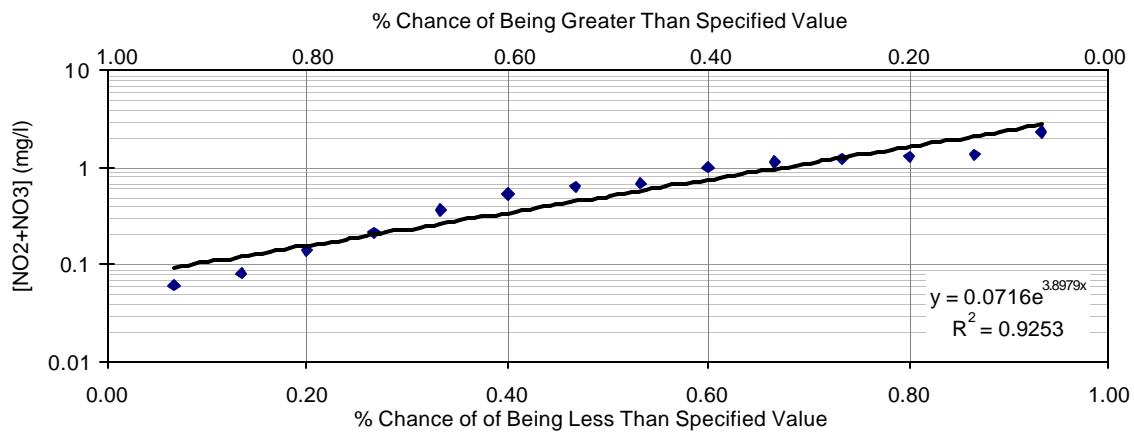


Figure E-15 Klamath Straits Drain at Highway 97, probability plot for nitrite plus nitrate, May – November 2000

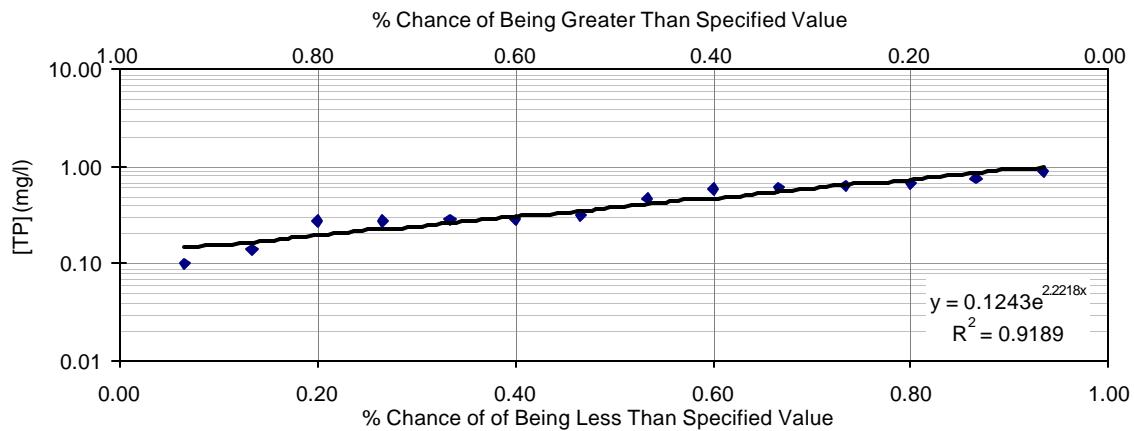


Figure E-16 Klamath Straits Drain at Highway 97, probability plot for total phosphorous, May – November 2000

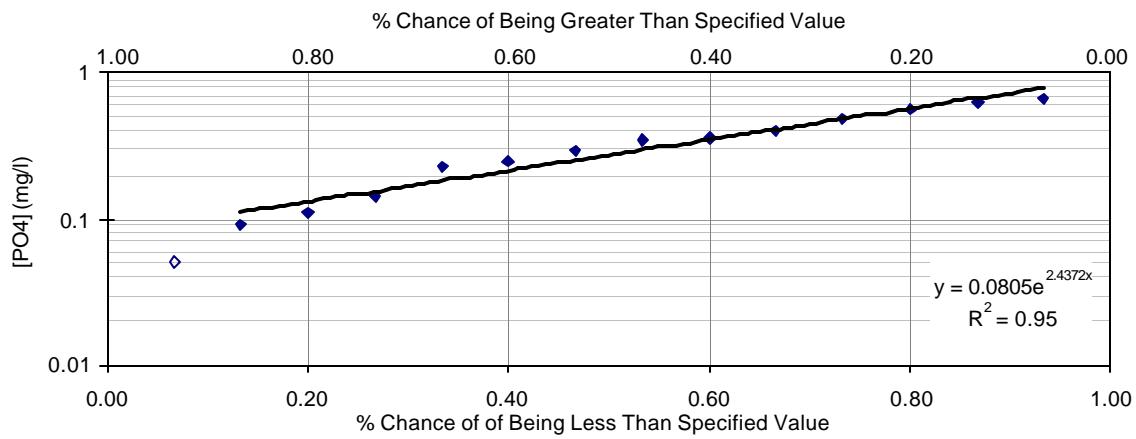


Figure E-17 Klamath Straits Drain at Highway 97, probability plot for orthophosphate, May – November 2000

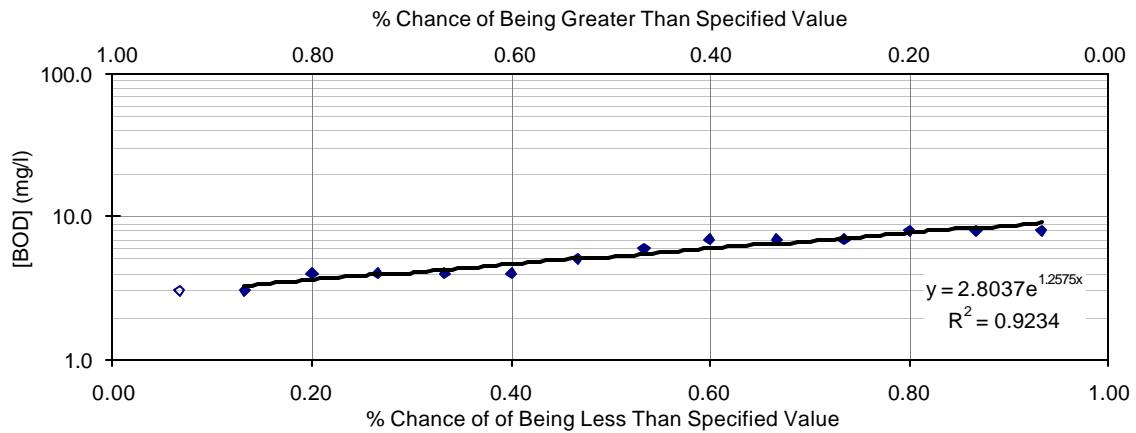


Figure E-18 Klamath Straits Drain at Highway 97, probability plot for BOD, May – November 2000

E.4 Klamath River at Miller Island

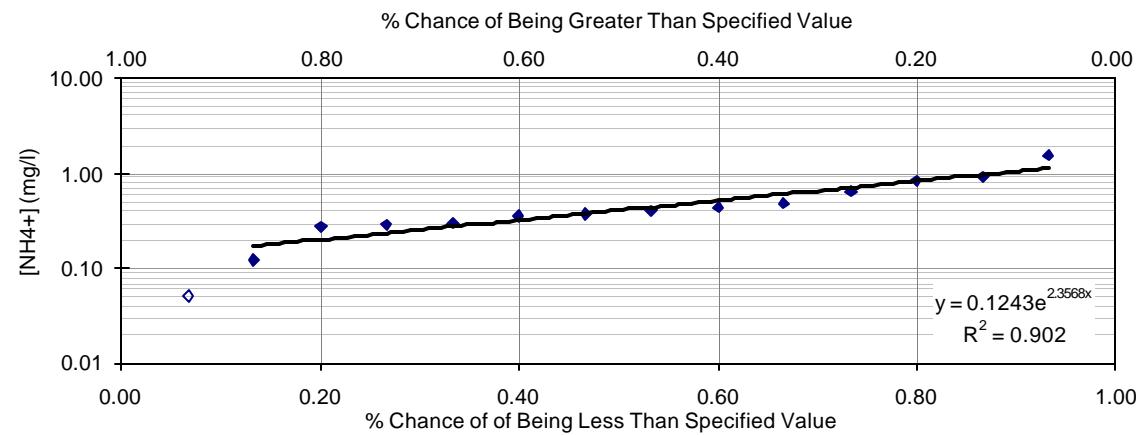


Figure E-19 Klamath River at Miller Island, probability plot for ammonia, May – November 2000

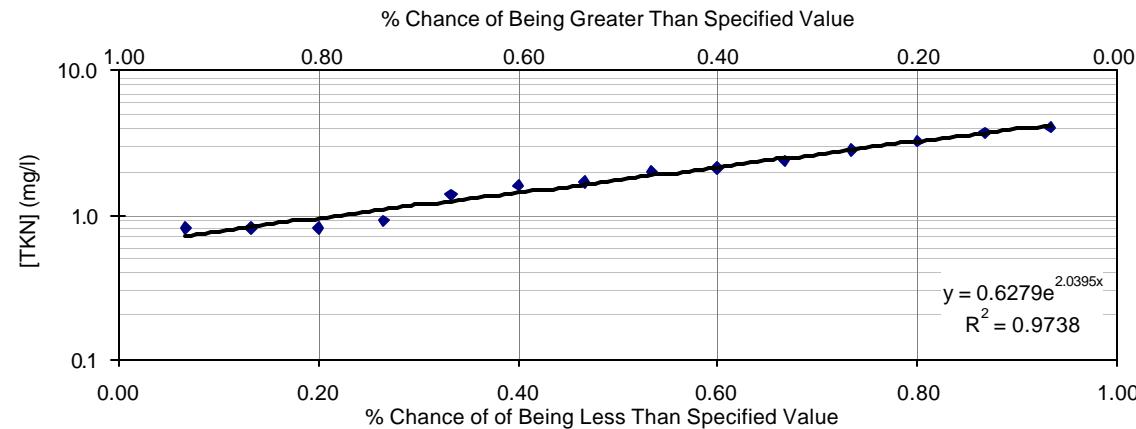


Figure E-20 Klamath River at Miller Island, probability plot for total Kjeldahl nitrogen, May – November 2000

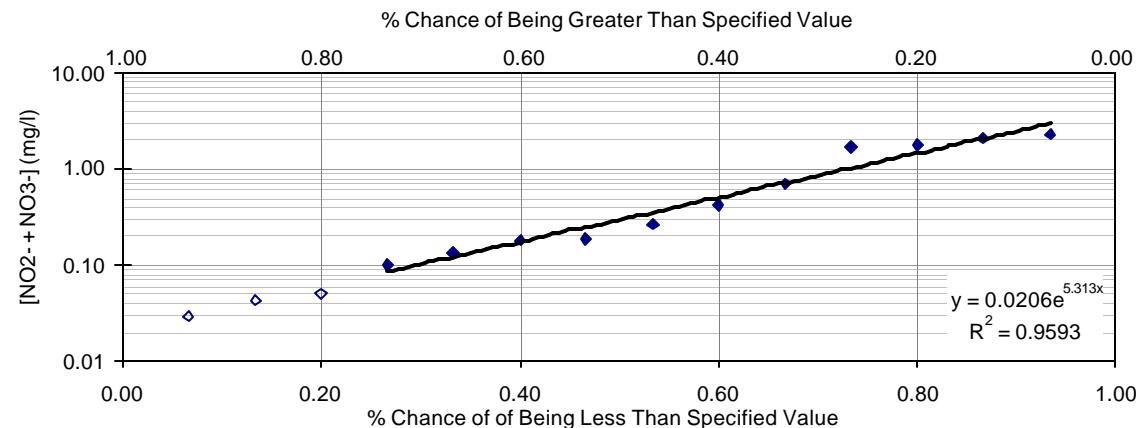


Figure E-21 Klamath River at Miller Island, probability plot for nitrite plus nitrate, May – November 2000

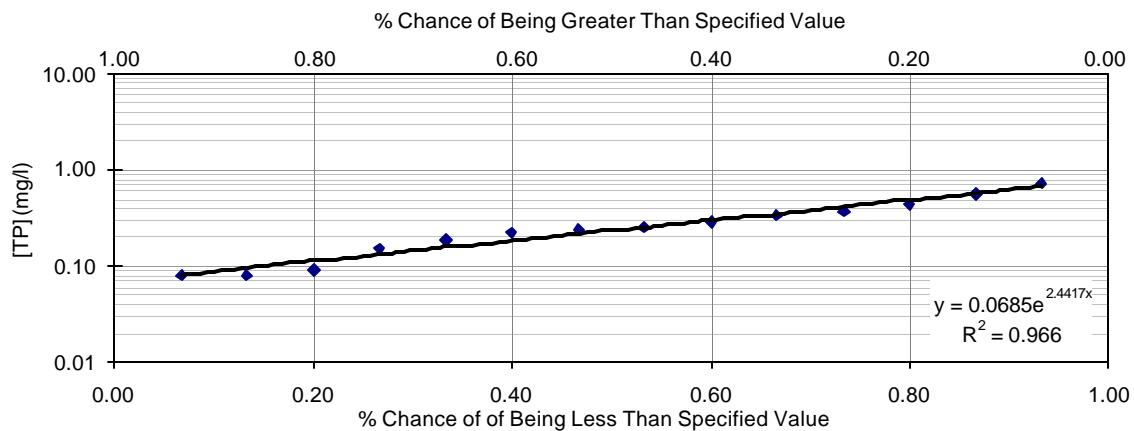


Figure E-22 Klamath River at Miller Island, probability plot for total phosphorous, May – November 2000

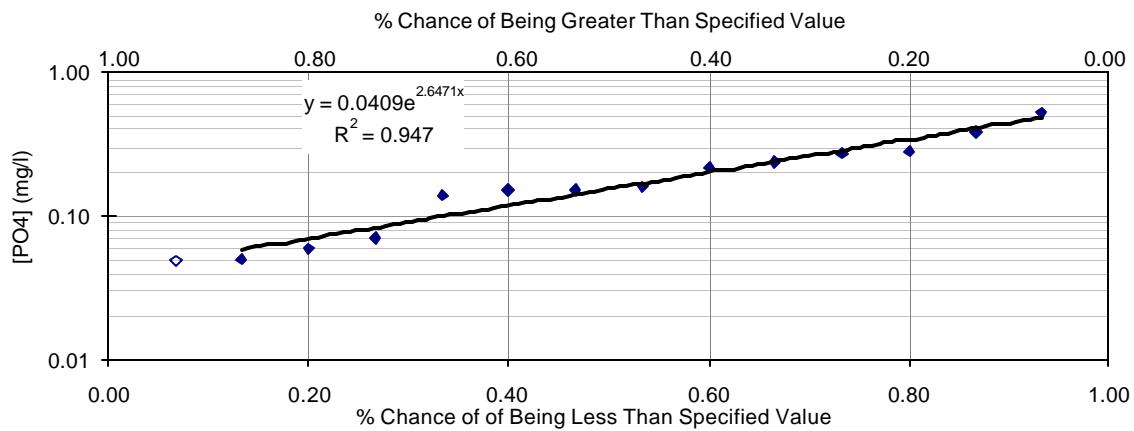


Figure E-23 Klamath River at Miller Island, probability plot for orthophosphate, May – November 2000

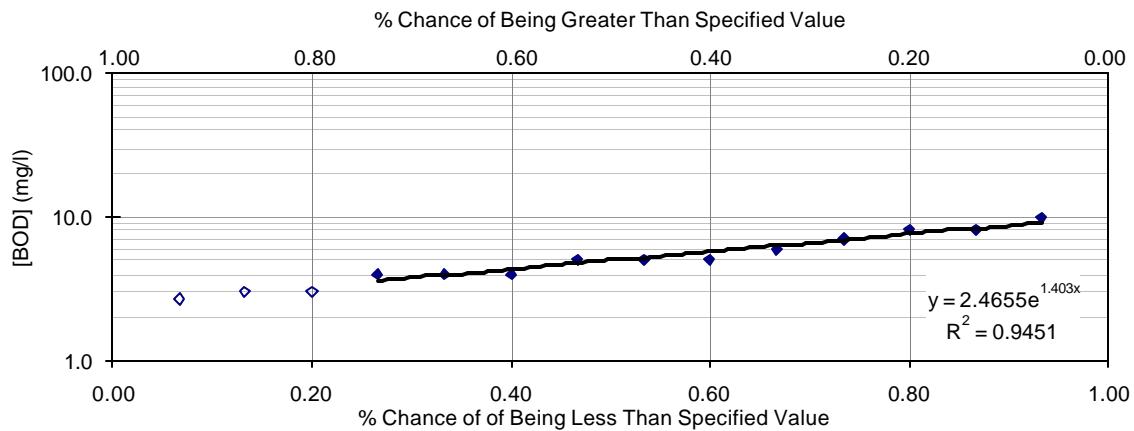


Figure E-24 Klamath River at Miller Island, probability plot for BOD, May – November 2000

E.5 Klamath River at Keno

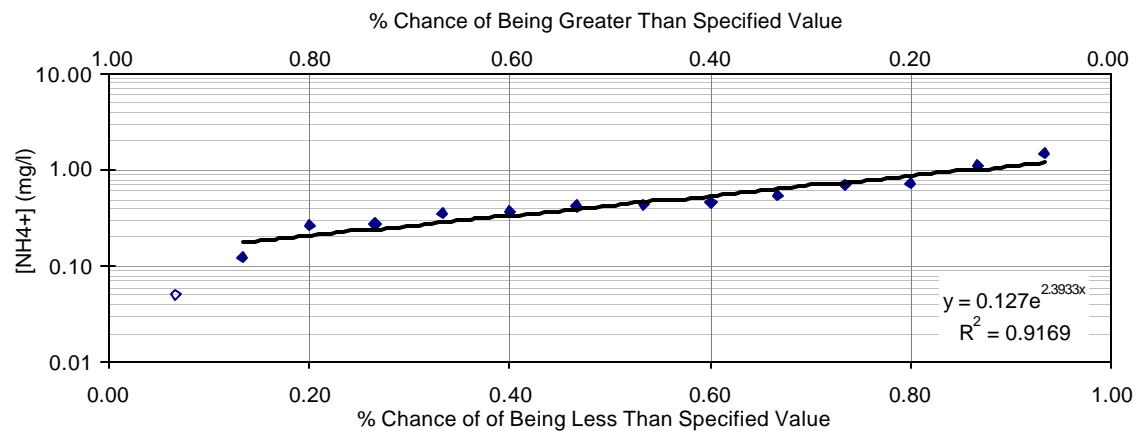


Figure E-25 Klamath River at Keno, probability plot for ammonia, May – November 2000

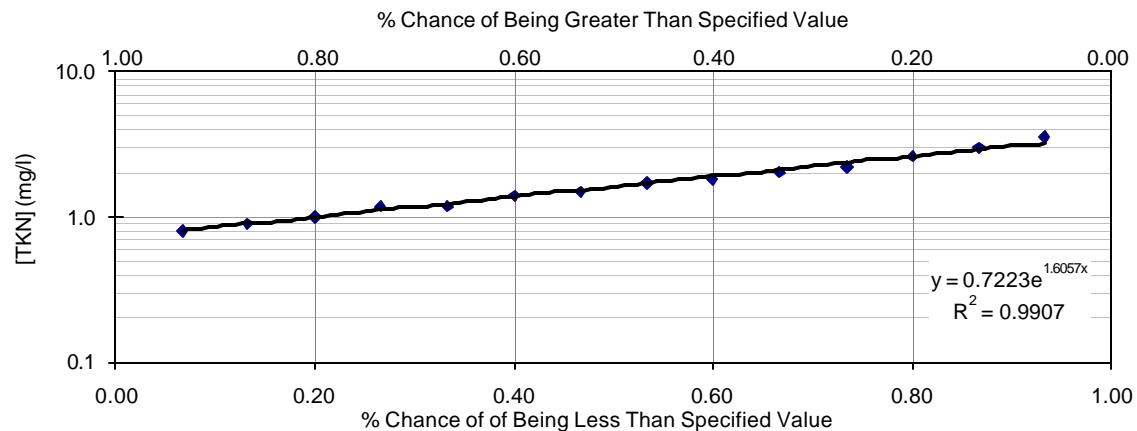


Figure E-26 Klamath River at Keno, probability plot for total Kjeldahl nitrogen, May – November 2000

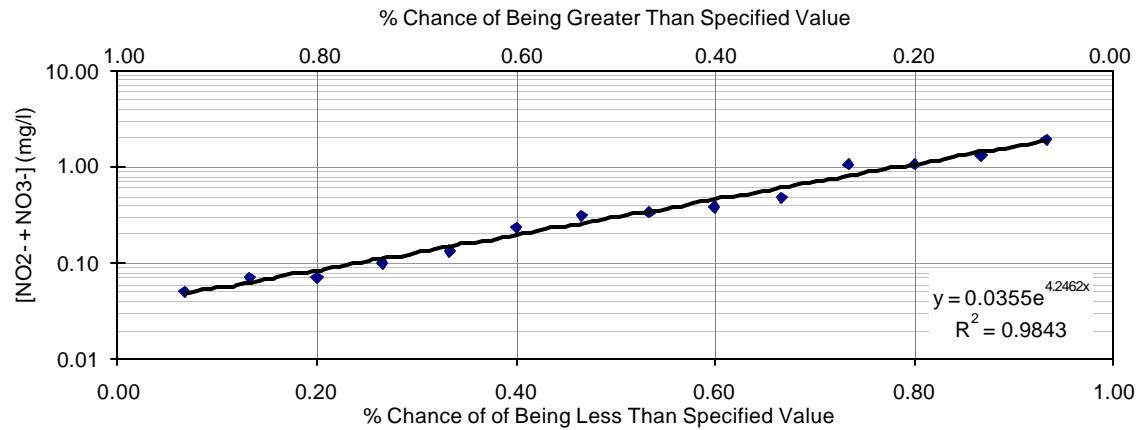


Figure E-27 Klamath River at Keno, probability plot for nitrite plus nitrate, May – November 2000

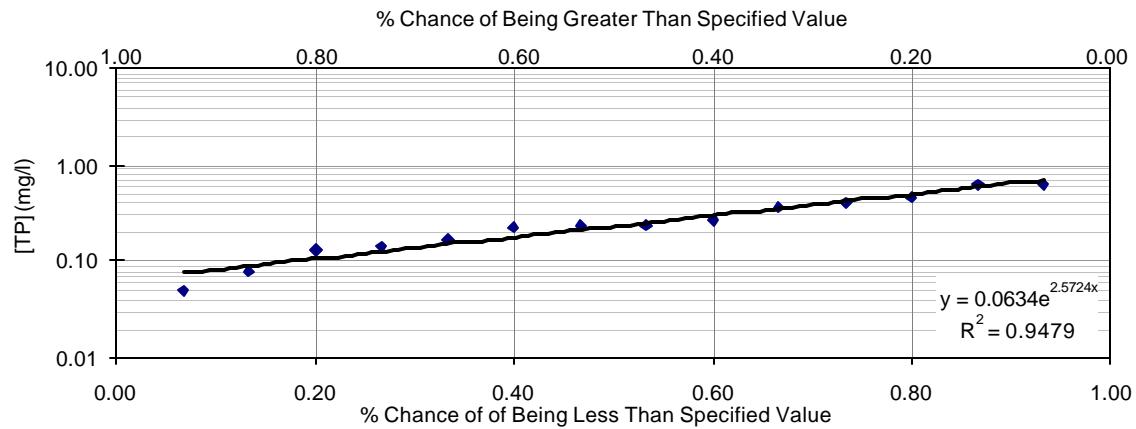


Figure E-28 Klamath River at Keno, probability plot for total phosphorous, May – November 2000

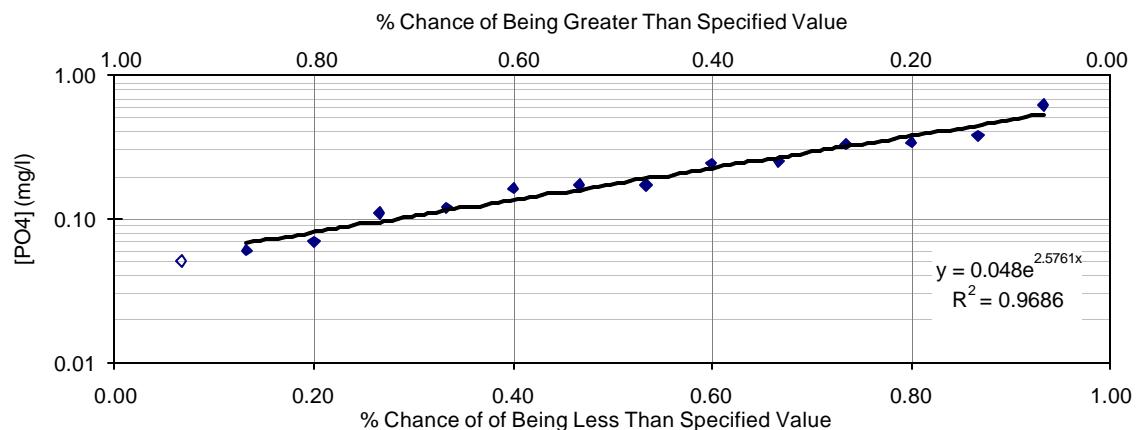


Figure E-29 Klamath River at Keno, probability plot for orthophosphate, May – November 2000

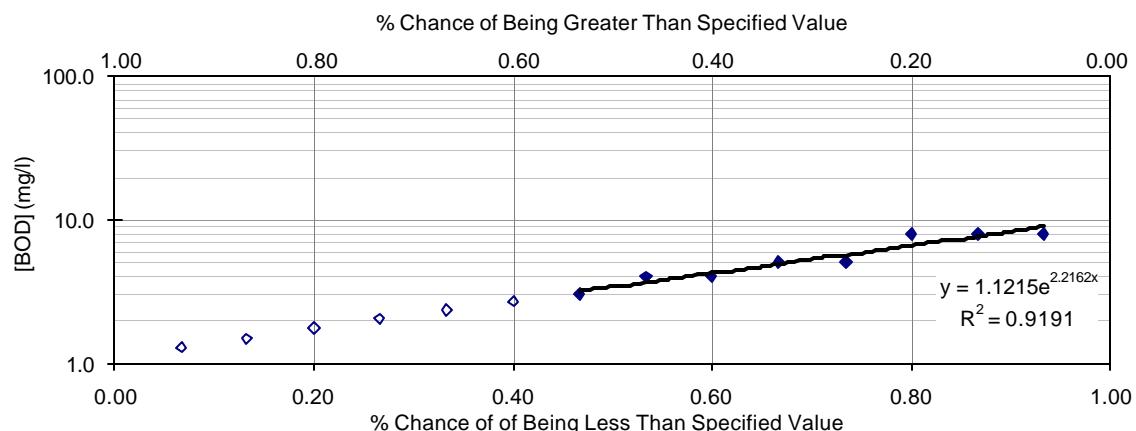


Figure E-30 Klamath River at Keno, probability plot for BOD, May – November 2000

E.6 Klamath River above Copco Reservoir

[Insufficient Data]

Figure E-31 Klamath River above Copco Reservoir, probability plot for ammonia, May – November 2000

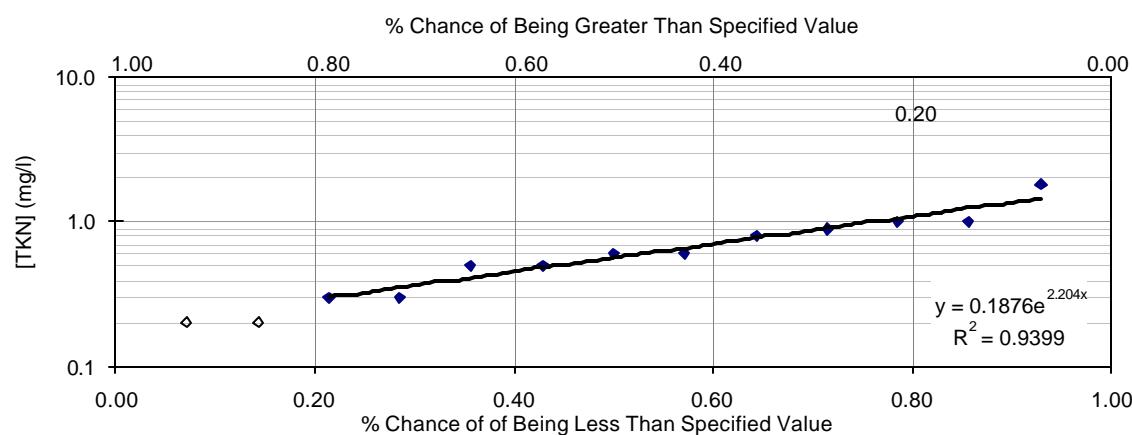


Figure E-32 Klamath River above Copco Reservoir, probability plot for total Kjeldahl nitrogen, May – November 2000

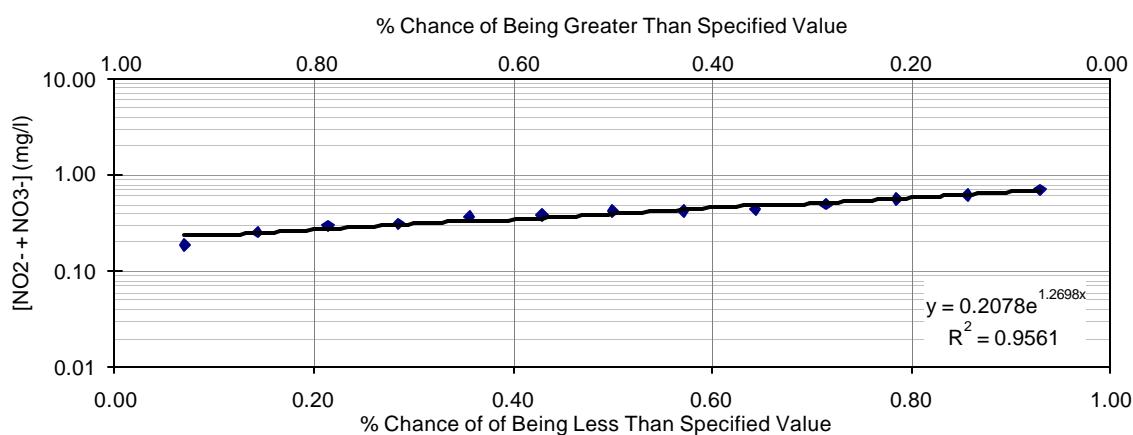


Figure E-33 Klamath River above Copco Reservoir, probability plot for nitrite plus nitrate, May – November 2000

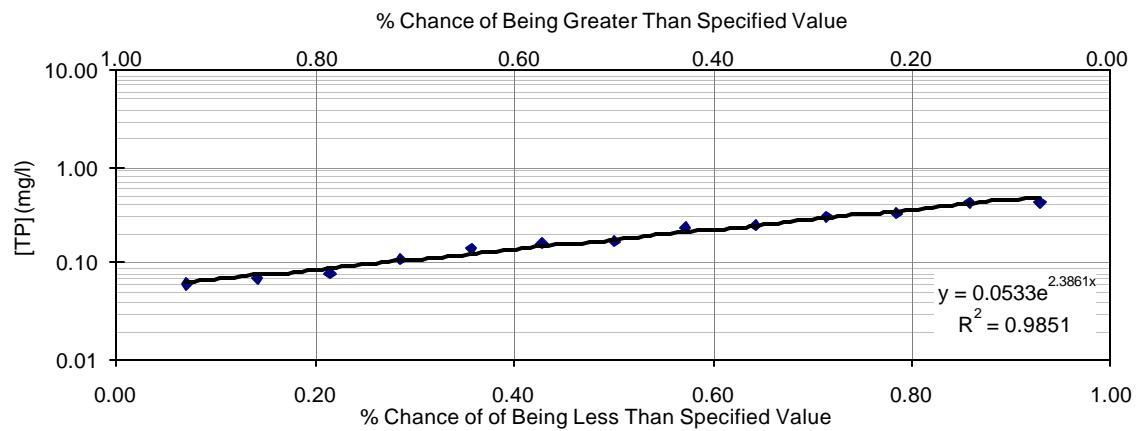


Figure E-34 Klamath River above Copco Reservoir, probability plot for total phosphorous, May – November 2000

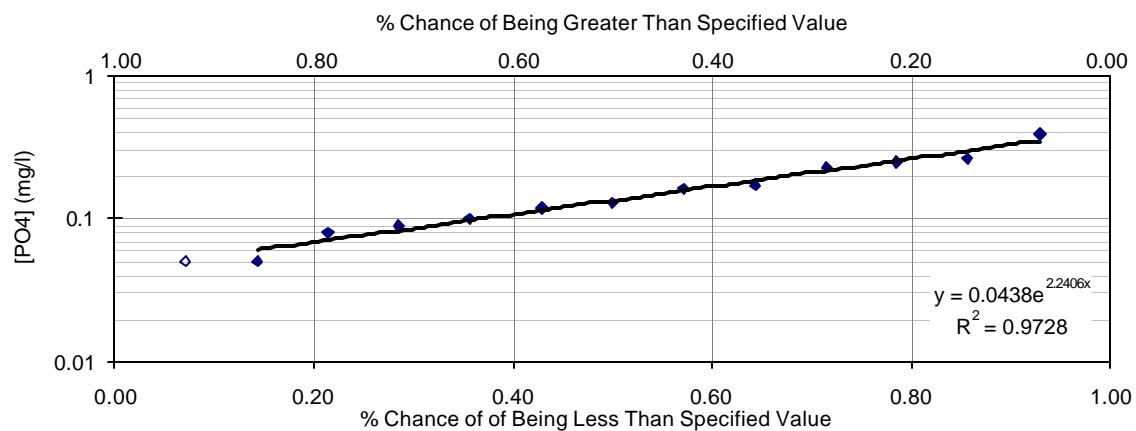


Figure E-35 Klamath River above Copco Reservoir, probability plot for orthophosphate, May – November 2000

[Insufficient Data]

Figure E-36 Klamath River above Copco Reservoir, probability plot for BOD, May – November 2000

E.7 Klamath River below Iron Gate Reservoir

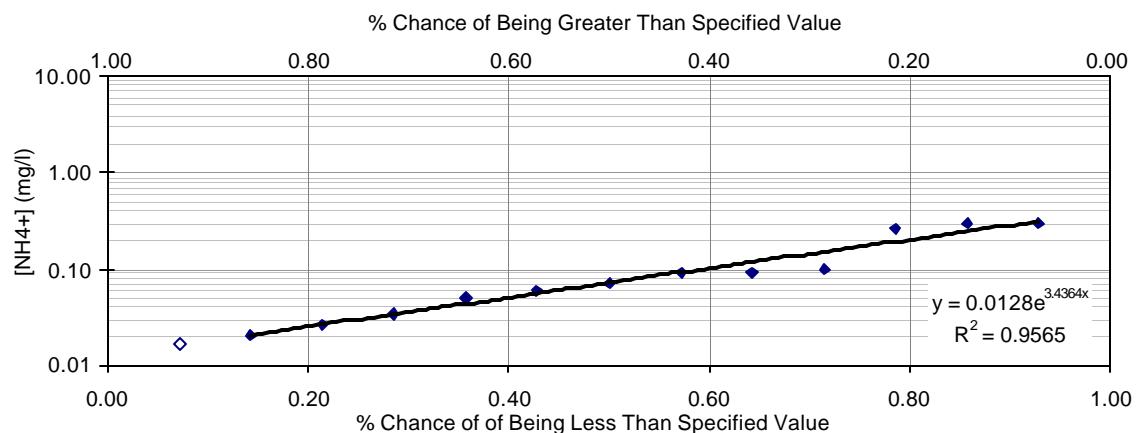


Figure E-37 Klamath River below Iron Gate Reservoir, probability plot for ammonia, May – November 2000

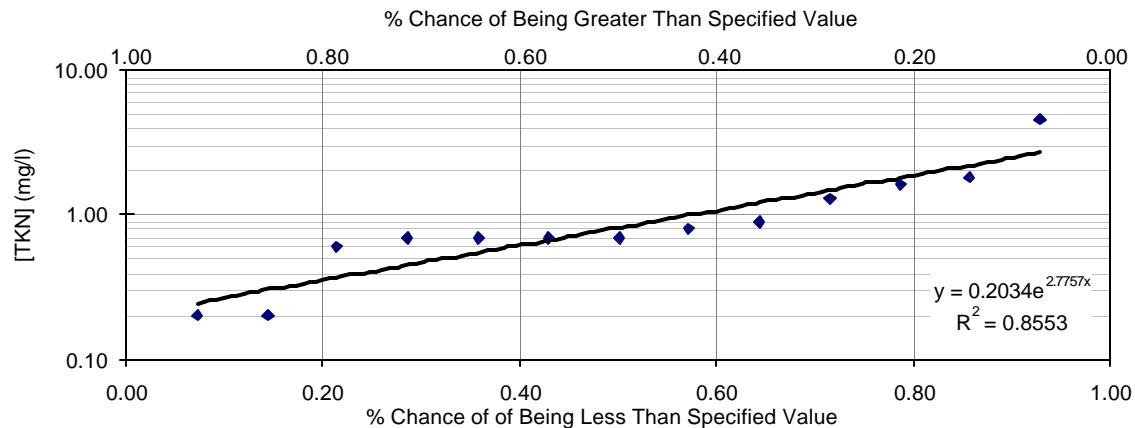


Figure E-38 Klamath River below Iron Gate Reservoir, probability plot for total Kjeldahl nitrogen, May – November 2000

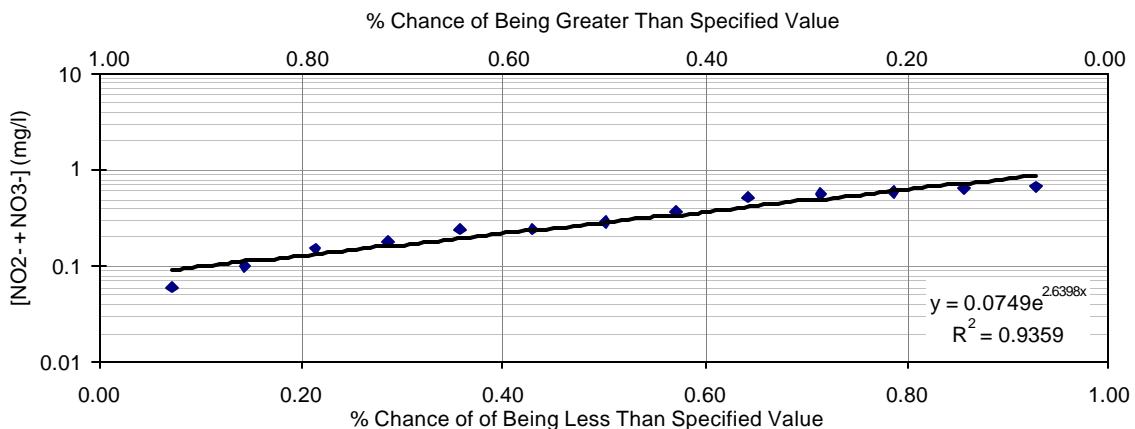


Figure E-39 Klamath River below Iron Gate Reservoir, probability plot for nitrite plus nitrate, May – November 2000

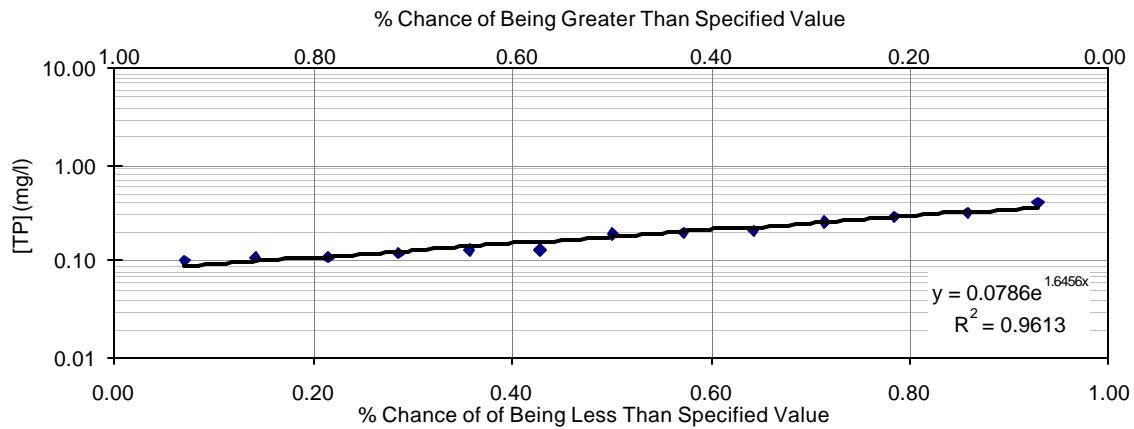


Figure E-40 Klamath River below Iron Gate Reservoir, probability plot for total phosphorous, May – November 2000

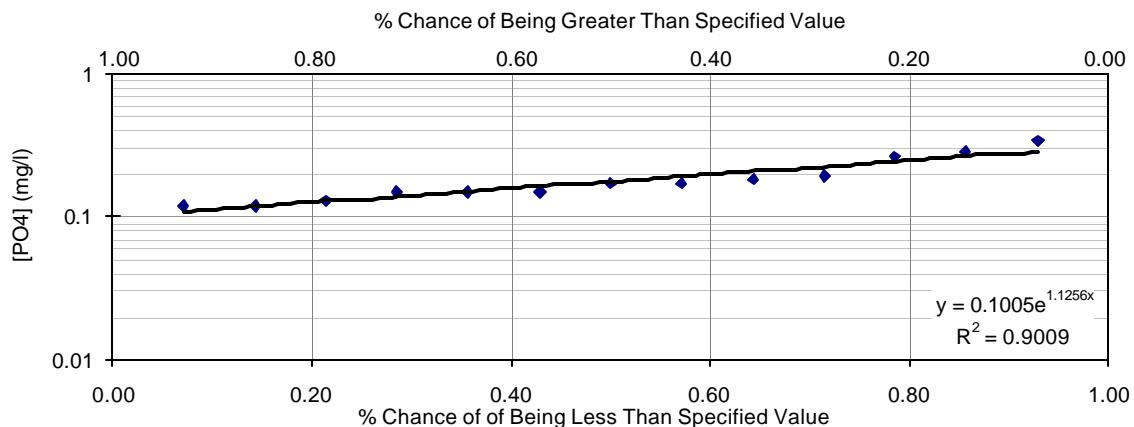


Figure E-41 Klamath River below Iron Gate Reservoir, probability plot for orthophosphate, May – November 2000

[Insufficient Data]

Figure E-42 Klamath River below Iron Gate Reservoir, probability plot for BOD, May – November 2000

E.8 Klamath River near Seiad Valley

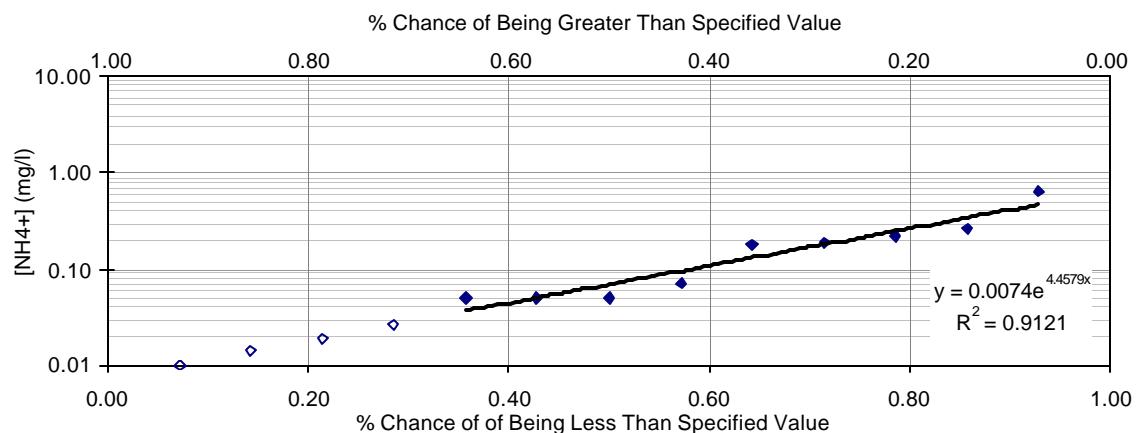


Figure E-43 Klamath River near Seiad Valley, probability plot for ammonia, May – November 2000

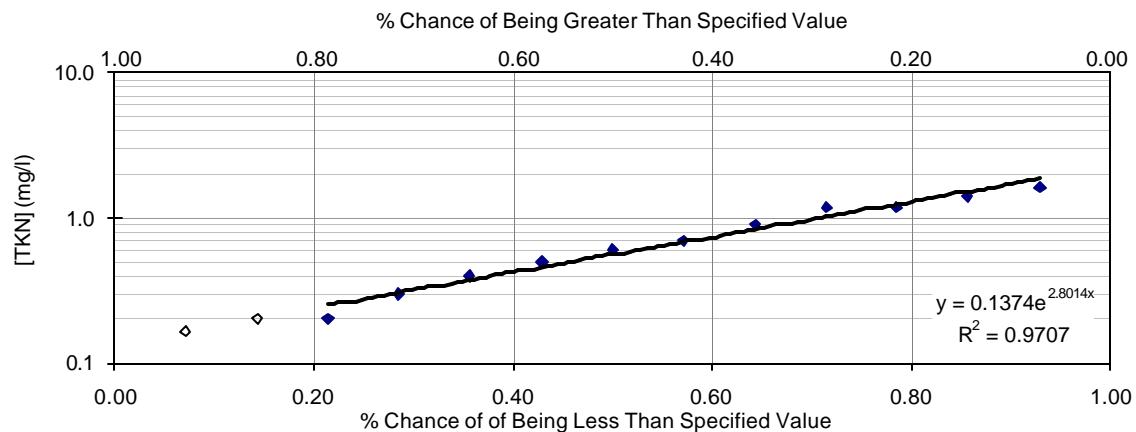


Figure E-44 Klamath River near Seiad Valley, probability plot for total Kjeldahl nitrogen, May – November 2000

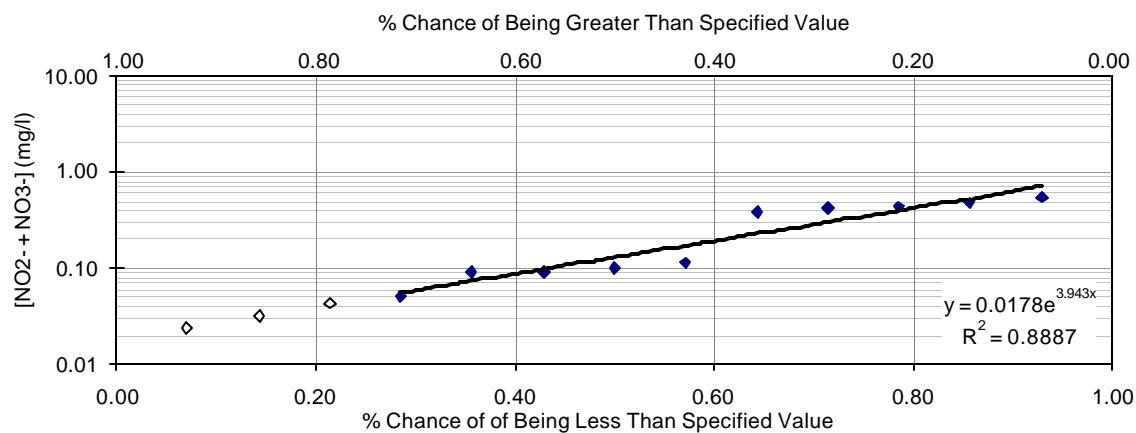


Figure E-45 Klamath River near Seiad Valley, probability plot for nitrite plus nitrate, May – November 2000

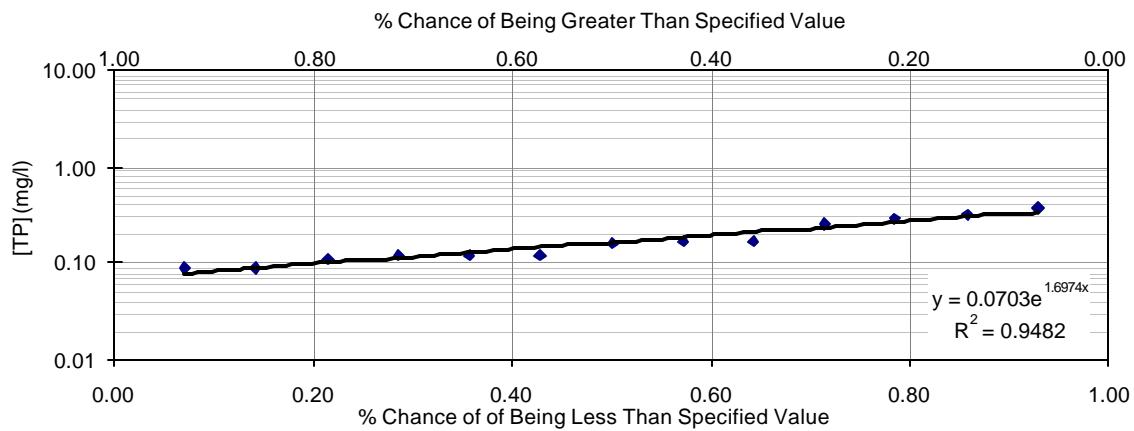


Figure E-46 Klamath River near Seiad Valley, probability plot for total phosphorous, May – November 2000

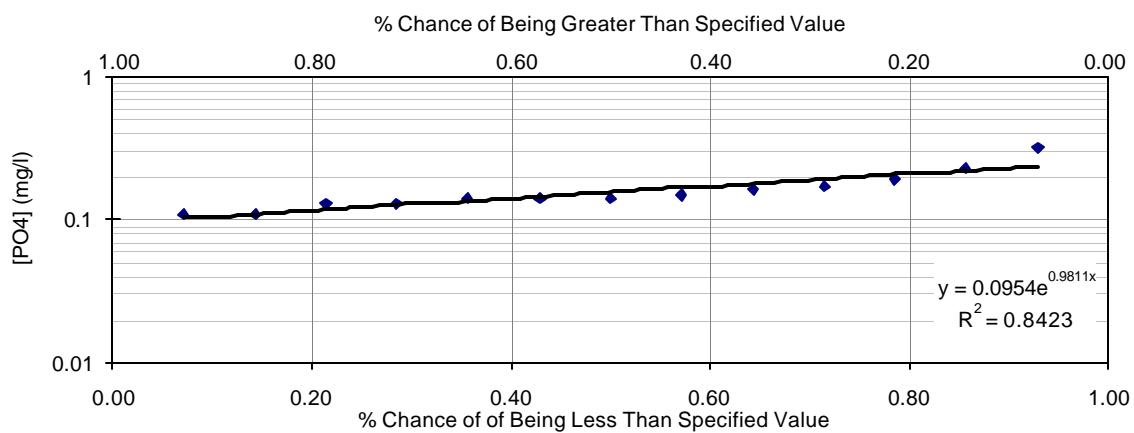


Figure E-47 Klamath River near Seiad Valley, probability plot for orthophosphate, May – November 2000

[Insufficient Data]

Figure E-48 Klamath River near Seiad Valley, probability plot for BOD, May – November 2000

E.9 Shasta River (RM 1.0)

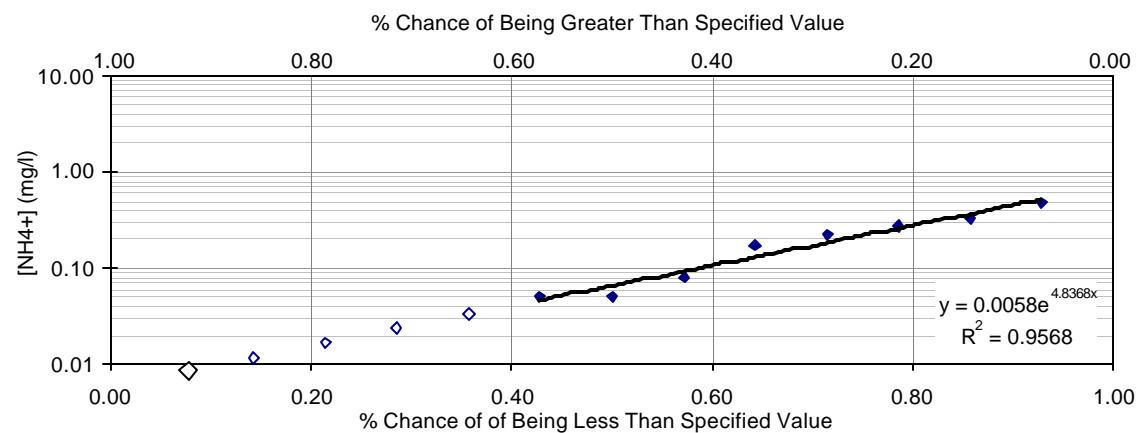


Figure E-49 Shasta River (RM 1.0), probability plot for ammonia, May – November 2000

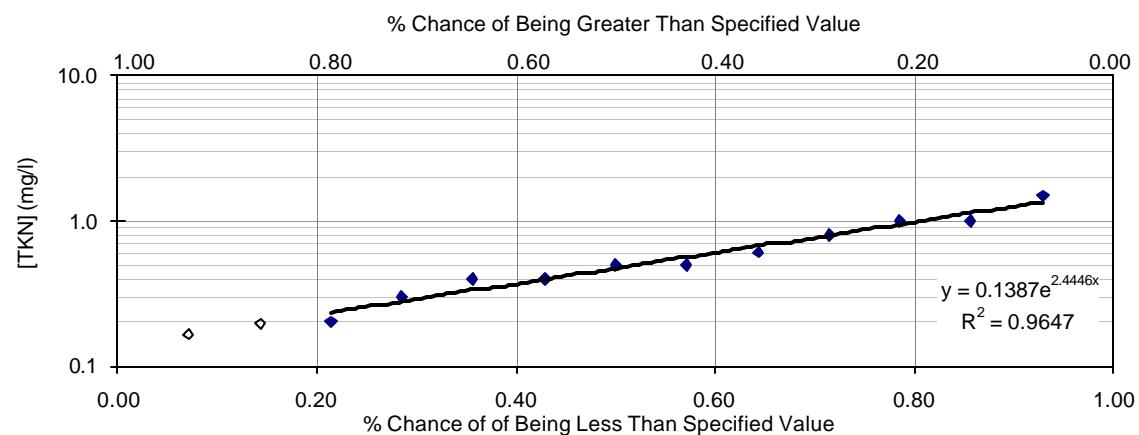


Figure E-50 Shasta River (RM 1.0), probability plot for total Kjeldahl nitrogen, May – November 2000

[Insufficient Data]

Figure E-51 Shasta River (RM 1.0), probability plot for nitrite plus nitrate, May – November 2000

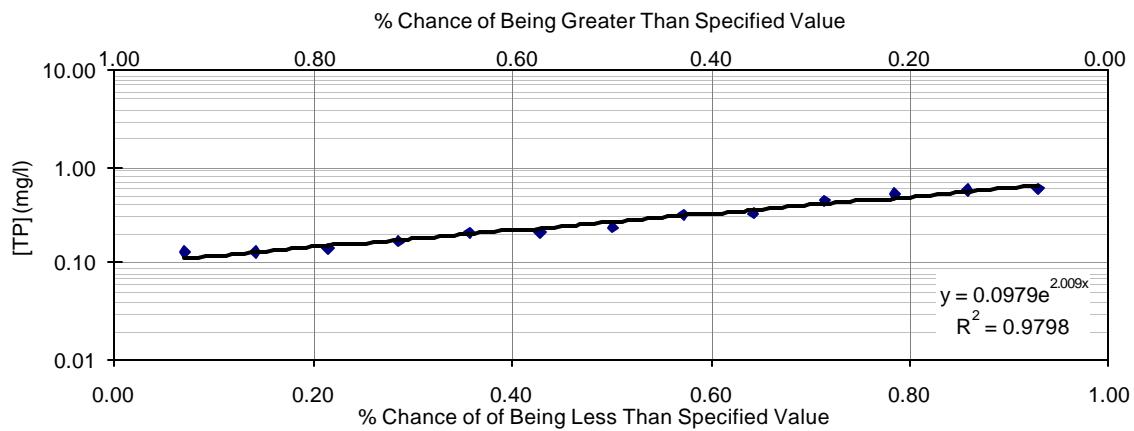


Figure E-52 Shasta River (RM 1.0), probability plot for total phosphorous, May – November 2000

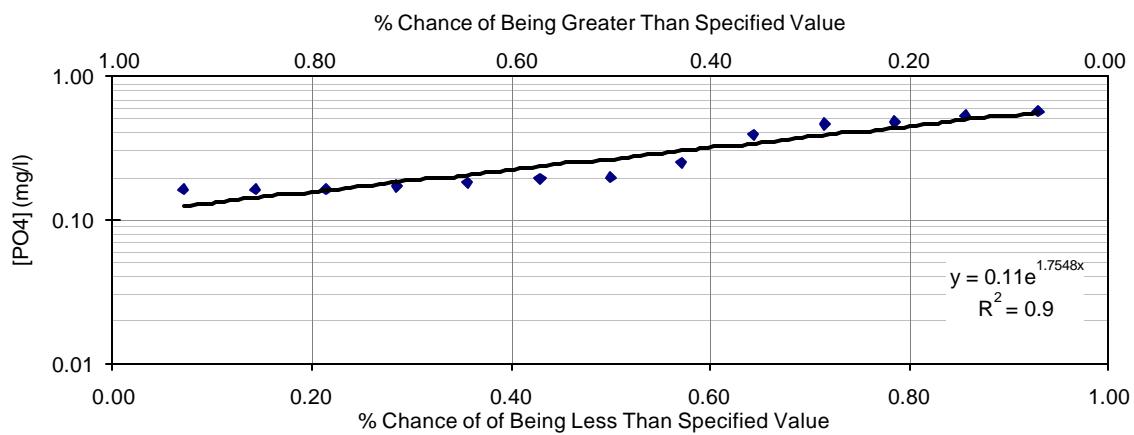


Figure E-53 Shasta River (RM 1.0), probability plot for orthophosphate, May – November 2000

[Insufficient Data]

Figure E-54 Shasta River (RM 1.0), probability plot for BOD, May – November 2000

E.10 Scott River near Ft. Jones (RM 23.4)

[Insufficient Data]

Figure E-55 Scott River near Ft. Jones (RM 23.4), probability plot for ammonia, May – November 2000

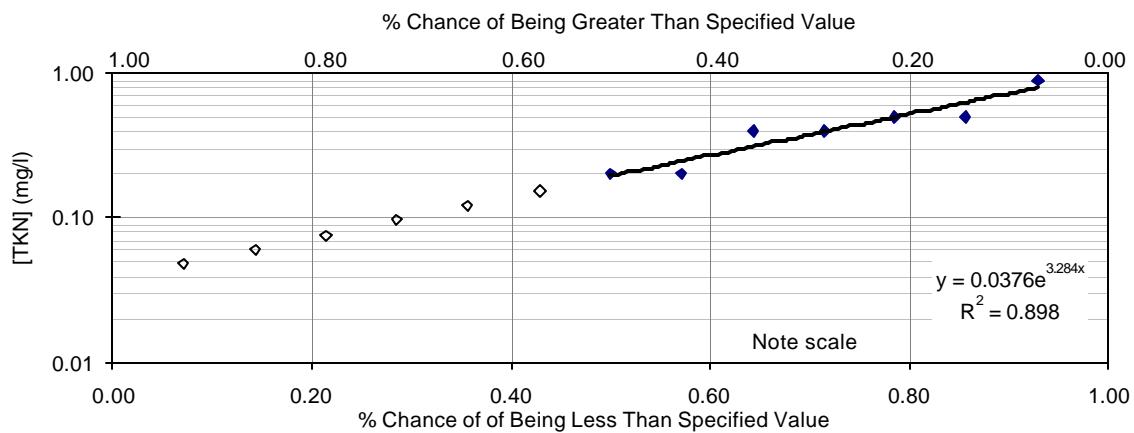


Figure E-56 Scott River near Ft. Jones (RM 23.4), probability plot for total Kjeldahl nitrogen, May – November 2000

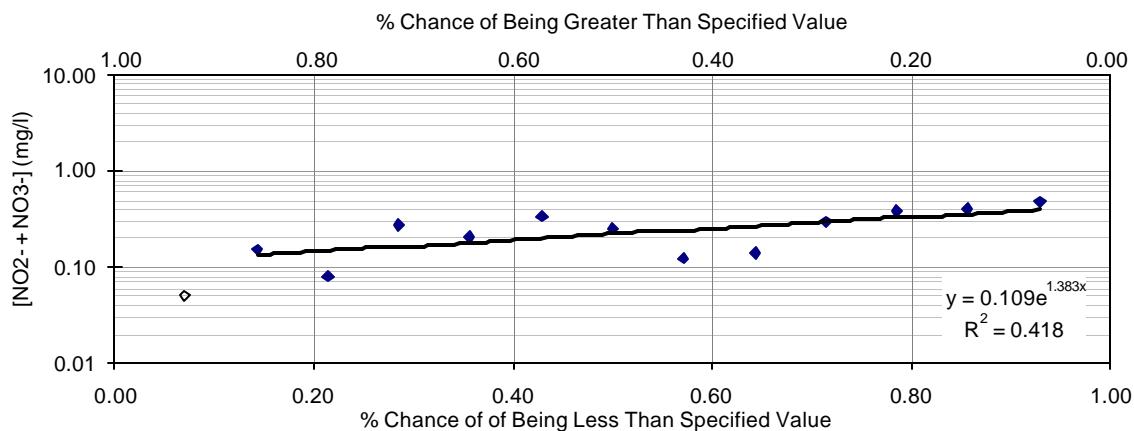


Figure E-57 Scott River near Ft. Jones (RM 23.4), probability plot for nitrite plus nitrate, May – November 2000

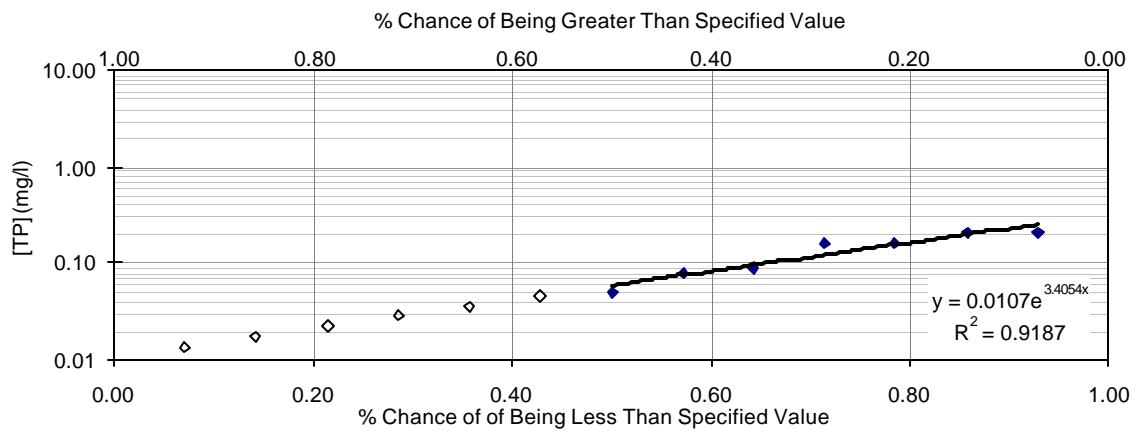


Figure E-58 Scott River near Ft. Jones (RM 23.4), probability plot for total phosphorous, May – November 2000

[Insufficient Data]

Figure E-59 Scott River near Ft. Jones (RM 23.4), probability plot for orthophosphate, May – November 2000

[Insufficient Data]

Figure E-60 Scott River near Ft. Jones (RM 23.4), probability plot for BOD, May – November 2000

F SYNOPTIC SURVEY DATA

Table F-1 Klamath River below Iron Gate Dam synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR bel.Irongate	KRIG	06/05/00	7:40	<0.05	0.8	0.07	0.3	0.25	0.23	<0.05
KR bel.Irongate	KRIG	06/05/00	12:50	0.14	0.8	0.08	0.3	0.35	0.25	0.12
KR bel.Irongate	KRIG	06/05/00	16:00	0.10	0.8	0.07	0.6	0.29	0.29	<0.05
KR bel.Irongate	KRIG	06/06/00	7:20	<0.05	0.7	0.07	0.9	0.26	0.24	0.06
KR bel.Irongate	KRIG	06/06/00	12:40	<0.05	0.7	0.06	0.5	0.44	0.29	0.06
KR bel.Irongate	KRIG	06/06/00	16:00	<0.05	0.7	0.07	0.9	0.28	0.28	0.05
KR bel.Irongate	KRIG	06/07/00	7:00	0.07	0.8	0.06	0.3	0.28	0.21	<0.05
KR bel.Irongate	KRIG	06/07/00	12:30	0.09	0.8	<0.05	0.6	0.26	0.23	<0.05
KR bel.Irongate	KRIG	06/07/00	14:50	0.10	0.8	<0.05	0.5	0.25	0.24	<0.05
KR bel.Irongate	KRIG	08/07/00	7:30	0.08	1.0	0.24	0.5	0.16	0.15	<0.05
KR bel.Irongate	KRIG	08/07/00	12:15	<0.05	1.8	0.24	0.7	0.11	0.15	<0.05
KR bel.Irongate	KRIG	08/07/00	16:00	0.07	0.8	0.26	0.6	0.16	0.14	<0.05
KR bel.Irongate	KRIG	08/08/00	7:15	0.05	0.7	0.36	0.5	0.12	0.16	<0.05
KR bel.Irongate	KRIG	08/08/00	11:50	0.05	0.4	0.32	0.5	0.13	0.15	<0.05
KR bel.Irongate	KRIG	08/08/00	16:00	0.07	0.4	0.32	0.6	0.13	0.16	<0.05
KR bel.Irongate	KRIG	08/09/00	7:15	0.10	0.7	0.28	0.3	0.12	0.16	<0.05
KR bel.Irongate	KRIG	08/09/00	10:40	0.09	0.3	0.37	0.3	0.12	0.15	<0.05
KR bel.Irongate	KRIG	08/09/00	14:30	0.09	0.6	0.35	0.3	0.12	0.16	<0.05

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) no data available

Table F-2 Klamath River above Shasta River synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR ab.Shasta	KRASH	06/05/00	6:00	<0.05	0.6	0.12	0.6	0.29	0.25	0.05
KR ab.Shasta	KRASH	06/05/00	11:10	0.29	0.7	0.06	0.5	0.22	0.21	<0.05
KR ab.Shasta	KRASH	06/05/00	15:00	<0.05	0.6	<0.05	0.7	0.35	0.22	<0.05
KR ab.Shasta	KRASH	06/06/00	6:00	<0.05	0.4	0.07	0.2	0.36	0.24	<0.05
KR ab.Shasta	KRASH	06/06/00	11:20	0.06	0.7	<0.05	0.7	0.25	0.23	0.08
KR ab.Shasta	KRASH	06/06/00	15:00	0.55	0.7	<0.05	0.7	0.28	0.24	<0.05
KR ab.Shasta	KRASH	06/07/00	6:00	0.09	0.6	<0.05	0.5	0.30	0.26	0.14
KR ab.Shasta	KRASH	06/07/00	11:15	0.08	0.8	<0.05	0.4	0.28	0.28	0.14
KR ab.Shasta	KRASH	06/07/00	15:45	0.12	0.7	<0.05	0.5	0.35	0.30	0.08
KR ab.Shasta	KRASH	08/07/00	6:30	0.06	0.8	0.23	0.6	0.15	0.14	<0.05
KR ab.Shasta	KRASH	08/07/00	11:15	0.06	1.1	0.25	0.6	0.15	0.15	<0.05
KR ab.Shasta	KRASH	08/07/00	15:00	0.05	0.7	0.21	0.8	0.15	0.15	<0.05
KR ab.Shasta	KRASH	08/08/00	6:10	<0.05	0.6	0.31	0.5	0.11	0.14	<0.05
KR ab.Shasta	KRASH	08/08/00	11:15	0.07	0.6	0.32	0.5	0.12	0.15	<0.05
KR ab.Shasta	KRASH	08/08/00	15:00	0.07	0.5	0.29	0.6	0.12	0.16	<0.05
KR ab.Shasta	KRASH	08/09/00	6:10	0.09	0.6	0.27	0.4	0.12	0.14	<0.05
KR ab.Shasta	KRASH	08/09/00	12:15	0.08	1.0	0.25	0.2	0.12	0.15	<0.05
KR ab.Shasta	KRASH	08/09/00	15:10	0.09	0.6	0.29	0.2	0.12	0.15	<0.05

(<) less than reporting limit

(k) below reporting limit of 40 ug/l

(-) no data available

Table F-3 Klamath River above Scott River synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR ab. Scott	KRASC	06/05/00	6:40	0.07	0.8	<0.05	0.7	0.32	0.25	<0.05
KR ab.Scott	KRASC	06/05/00	12:20	0.34	0.6	<0.05	0.4	0.24	0.23	0.07
KR ab.Scott	KRASC	06/05/00	16:20	0.70	0.8	<0.05	0.8	0.25	0.23	0.06
KR ab.Scott	KRASC	06/06/00	6:45	<0.05	0.6	<0.05	0.7	0.38	0.25	0.1
KR ab.Scott	KRASC	06/06/00	12:00	0.15	0.7	<0.05	0.2	0.32	0.25	<0.05
KR ab.Scott	KRASC	06/06/00	15:15	<0.05	0.8	<0.05	0.8	0.31	0.26	<0.05
KR ab.Scott	KRASC	06/07/00	7:25	<0.05	0.6	<0.05	0.3	0.23	0.26	<0.05
KR ab.Scott	KRASC	06/07/00	11:20	<0.05	0.7	<0.05	0.2	0.25	0.25	<0.05
KR ab.Scott	KRASC	06/07/00	15:15	<0.05	1.0	<0.05	0.4	0.33	0.30	<0.05
KR ab.Scott	KRASC	08/07/00	6:50	0.08	0.8	0.16	0.3	0.15	0.14	<0.05
KR ab.Scott	KRASC	08/07/00	11:00	0.08	0.6	0.16	0.4	0.15	0.15	<0.05
KR ab.Scott	KRASC	08/07/00	15:25	0.05	0.8	0.15	0.2	0.17	0.25	<0.05
KR ab.Scott	KRASC	08/08/00	6:15	0.05	0.5	0.19	0.5	0.11	0.14	<0.05
KR ab.Scott	KRASC	08/08/00	11:00	<0.05	0.4	0.30	0.2	0.12	0.14	<0.05
KR ab.Scott	KRASC	08/08/00	15:50	<0.05	0.6	0.18	0.2	0.11	0.15	<0.05
KR ab.Scott	KRASC	08/09/00	6:15	0.09	0.5	0.2	0.2	0.11	0.14	<0.05
KR ab.Scott	KRASC	08/09/00	11:00	0.08	1.0	0.16	0.2	0.12	0.14	<0.05
KR ab.Scott	KRASC	08/09/00	15:15	0.10	1.0	0.15	0.3	0.12	0.14	<0.05

(<) less than reporting limit

(l) below reporting limit of 40 ug/l

(-) no data available

Table F-4 Klamath River near Seiad Valley synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR @ Seiad	KRSV	06/05/00	7:30	0.36	0.4	<0.05	0.4	0.27	0.21	<0.05
KR @ Seiad	KRSV	06/05/00	13:00	<0.05	0.5	<0.05	0.5	0.20	0.18	<0.05
KR @ Seiad	KRSV	06/05/00	16:00	0.05	0.5	<0.05	0.4	0.22	0.20	<0.05
KR @ Seiad	KRSV	06/06/00	7:20	0.26	0.6	<0.05	0.6	0.27	0.23	<0.05
KR @ Seiad	KRSV	06/06/00	10:45	0.32	0.4	<0.05	0.5	0.19	0.16	0.09
KR @ Seiad	KRSV	06/06/00	14:30	0.27	0.4	<0.05	0.5	0.23	0.23	<0.05
KR @ Seiad	KRSV	06/07/00	6:30	<0.05	0.6	<0.05	0.3	0.21	0.20	<0.05
KR @ Seiad	KRSV	06/07/00	10:30	0.08	0.6	<0.05	0.3	0.18	0.18	<0.05
KR @ Seiad	KRSV	06/07/00	14:30	0.11	0.5	<0.05	0.1	0.22	0.22	0.05
KR @ Seiad	KRSV	08/07/00	7:45	0.08	0.8	0.13	0.4	0.16	0.13	<0.05
KR @ Seiad	KRSV	08/07/00	11:45	0.05	1.20	0.10	0.4	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/07/00	14:40	0.05	0.4	0.07	0.4	0.13	0.12	<0.05
KR @ Seiad	KRSV	08/08/00	7:30	<0.05	0.7	0.14	0.4	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/08/00	12:00	0.06	0.4	0.11	0.4	0.11	0.12	<0.05
KR @ Seiad	KRSV	08/08/00	14:45	0.12	0.5	0.06	0.4	0.10	0.12	<0.05
KR @ Seiad	KRSV	08/09/00	7:10	0.08	0.2	0.16	0.3	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/09/00	12:10	0.08	0.6	0.08	<0.2	0.11	0.12	<0.05
KR @ Seiad	KRSV	08/09/00	14:30	0.08	0.5	0.10	0.2	0.11	0.11	<0.05

(<) less than reporting limit

(m) below reporting limit of 40 ug/l

(-) no data available

Table F-5 Shasta River near mouth synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Shasta River	SHR1	06/05/00	6:30	<0.05	0.5	<0.05	0.6	0.52	0.46	0.10
Shasta River	SHR1	06/05/00	11:45	0.08	0.5	<0.05	0.6	0.44	0.42	0.08
Shasta River	SHR1	06/05/00	15:15	0.34	0.5	<0.05	0.6	0.51	0.41	0.05
Shasta River	SHR1	06/06/00	6:30	<0.05	0.6	<0.05	0.9	0.71	0.49	<0.05
Shasta River	SHR1	06/06/00	11:00	0.23	0.8	<0.05	0.7	0.61	0.48	0.21
Shasta River	SHR1	06/06/00	15:15	<0.05	0.7	<0.05	0.7	0.56	0.56	<0.05
Shasta River	SHR1	06/07/00	10:00	0.12	0.8	<0.05	0.4	0.57	0.50	0.06
Shasta River	SHR1	06/07/00	11:30	0.09	0.6	<0.05	0.3	0.51	0.44	<0.05
Shasta River	SHR1	06/07/00	15:55	0.08	0.7	<0.05	0.3	0.50	0.50	0.05
Shasta River	SHR1	08/07/00	7:00	<0.05	0.6	<0.05	0.5	0.18	0.22	<0.05
Shasta River	SHR1	08/07/00	10:45	0.05	1.0	<0.05	0.4	0.17	0.20	<0.05
Shasta River	SHR1	08/07/00	14:45	0.05	0.5	<0.05	0.4	0.18	0.20	<0.05
Shasta River	SHR1	08/08/00	6:40	0.05	0.3	<0.05	0.5	0.16	0.20	<0.05
Shasta River	SHR1	08/08/00	10:50	0.05	0.3	<0.05	0.3	0.15	0.20	<0.05
Shasta River	SHR1	08/08/00	14:45	0.05	0.4	<0.05	0.4	0.12	0.20	<0.05
Shasta River	SHR1	08/09/00	6:30	0.07	0.7	<0.05	0.3	0.20	0.25	<0.05
Shasta River	SHR1	08/09/00	12:00	0.06	0.6	<0.05	0.4	0.19	0.26	<0.05
Shasta River	SHR1	08/09/00	15:30	0.07	0.3	<0.05	0.2	0.21	0.25	<0.05

(<) less than reporting limit

(n) below reporting limit of 40 ug/l

(-) no data available

Table F-6 Scott River near mouth synoptic survey water quality data, June 5-7 and August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ ⁻	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Scott River Mouth	SCR1	06/05/00	6:20	0.35	0.4	<0.05	0.4	0.14	0.10	<0.05
Scott River Mouth	SCR1	06/05/00	12:05	<0.05	0.2	<0.05	0.3	0.15	0.13	<0.05
Scott River Mouth	SCR1	06/05/00	16:15	0.28	<0.2	<0.05	0.4	0.14	0.09	<0.05
Scott River Mouth	SCR1	06/06/00	6:20	<0.05	0.4	<0.05	0.6	0.26	0.10	<0.05
Scott River Mouth	SCR1	06/06/00	11:50	0.33	0.4	<0.05	0.5	0.13	0.11	<0.05
Scott River Mouth	SCR1	06/06/00	15:00	0.16	0.3	<0.05	0.5	0.18	0.13	<0.05
Scott River Mouth	SCR1	06/07/00	7:05	<0.05	0.6	<0.05	<0.2	0.10	0.10	<0.05
Scott River Mouth	SCR1	06/07/00	11:35	0.10	0.3	<0.05	<0.2	0.18	0.12	<0.05
Scott River Mouth	SCR1	06/07/00	15:00	<0.05	0.4	<0.05	0.2	0.15	0.15	<0.05
Scott River Mouth	SCR1	08/07/00	6:35	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/07/00	11:15	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/07/00	15:10	<0.05	<0.2	<0.05	<0.2	0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/08/00	6:45	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/08/00	11:30	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/08/00	15:30	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/09/00	6:30	0.06	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/09/00	11:20	<0.05	0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR1	08/09/00	15:00	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05

(<) less than reporting limit

(o) below reporting limit of 40 ug/l

(-) no data available

G SYNOPTIC SURVEY DATA: SUMMARY STATISTICS

Table G-1 Klamath River below Iron Gate Dam synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR bel.Irongate	KRIG	06/05/00	7:40	0.05	0.8	0.07	0.3	0.25	0.23	<0.05
KR bel.Irongate	KRIG	06/05/00	12:50	0.14	0.8	0.08	0.3	0.35	0.25	0.12
KR bel.Irongate	KRIG	06/05/00	16:00	0.10	0.8	0.07	0.6	0.29	0.29	<0.05
KR bel.Irongate	KRIG	06/06/00	7:20	0.05	0.7	0.07	0.9	0.26	0.24	0.06
KR bel.Irongate	KRIG	06/06/00	12:40	0.05	0.7	0.06	0.5	0.44	0.29	0.06
KR bel.Irongate	KRIG	06/06/00	16:00	0.04	0.7	0.07	0.9	0.28	0.28	0.05
KR bel.Irongate	KRIG	06/07/00	7:00	0.07	0.8	0.06	0.3	0.28	0.21	<0.05
KR bel.Irongate	KRIG	06/07/00	12:30	0.09	0.8	0.05	0.6	0.26	0.23	<0.05
KR bel.Irongate	KRIG	06/07/00	14:50	0.10	0.8	0.05	0.5	0.25	0.24	<0.05
				average	0.08	0.77	0.06	0.54	0.30	0.25
				minimum	0.04	0.70	0.05	0.30	0.25	0.21
				maximum	0.14	0.80	0.08	0.90	0.44	0.29
				median	0.07	0.80	0.07	0.50	0.28	0.24
				std. dev	0.033	0.050	0.010	0.235	0.062	0.029

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-2 Klamath River below Iron Gate Dam synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR bel.Irongate	KRIG	08/07/00	7:30	0.08	1.0	0.24	0.5	0.16	0.15	<0.05
KR bel.Irongate	KRIG	08/07/00	12:15	0.05	1.8	0.24	0.7	0.11	0.15	<0.05
KR bel.Irongate	KRIG	08/07/00	16:00	0.07	0.8	0.26	0.6	0.16	0.14	<0.05
KR bel.Irongate	KRIG	08/08/00	7:15	0.05	0.7	0.36	0.5	0.12	0.16	<0.05
KR bel.Irongate	KRIG	08/08/00	11:50	0.05	0.4	0.32	0.5	0.13	0.15	<0.05
KR bel.Irongate	KRIG	08/08/00	16:00	0.07	0.4	0.32	0.6	0.13	0.16	<0.05
KR bel.Irongate	KRIG	08/09/00	7:15	0.10	0.7	0.28	0.3	0.12	0.16	<0.05
KR bel.Irongate	KRIG	08/09/00	10:40	0.09	0.3	0.37	0.3	0.12	0.15	<0.05
KR bel.Irongate	KRIG	08/09/00	14:30	0.09	0.6	0.35	0.3	0.12	0.16	<0.05
				average	0.07	0.74	0.30	0.48	0.13	0.15
				minimum	0.05	0.30	0.24	0.30	0.11	0.14
				maximum	0.10	1.80	0.37	0.70	0.16	0.16
				median	0.07	0.70	0.32	0.50	0.12	0.15
				std. dev	0.019	0.453	0.051	0.148	0.018	0.007

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-3 Klamath River above Shasta River synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv.
										Org P
KR ab.Shasta	KRASH	06/05/00	6:00	0.02	0.6	0.12	0.6	0.29	0.25	0.05
KR ab.Shasta	KRASH	06/05/00	11:10	0.29	0.7	0.06	0.5	0.22	0.21	<0.05
KR ab.Shasta	KRASH	06/05/00	15:00	0.01	0.6	<0.05	0.7	0.35	0.22	<0.05
KR ab.Shasta	KRASH	06/06/00	6:00	0.03	0.4	0.07	0.2	0.36	0.24	<0.05
KR ab.Shasta	KRASH	06/06/00	11:20	0.06	0.7	<0.05	0.7	0.25	0.23	0.08
KR ab.Shasta	KRASH	06/06/00	15:00	0.55	0.7	<0.05	0.7	0.28	0.24	<0.05
KR ab.Shasta	KRASH	06/07/00	6:00	0.09	0.6	<0.05	0.5	0.30	0.26	0.14
KR ab.Shasta	KRASH	06/07/00	11:15	0.08	0.8	<0.05	0.4	0.28	0.28	0.14
KR ab.Shasta	KRASH	06/07/00	15:45	0.12	0.7	<0.05	0.5	0.35	0.30	0.08
				average	0.14	0.64	-	0.30	0.25	-
				minimum	0.01	0.40	<0.05	0.20	0.22	0.21
				maximum	0.55	0.80	0.12	0.70	0.36	0.30
				median	0.08	0.70	-	0.50	0.29	0.24
				std. dev	0.176	0.113	-	0.166	0.048	0.029

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-4 Klamath River above Shasta River synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv.
										Org P
KR ab.Shasta	KRASH	08/07/00	6:30	0.06	0.8	0.23	0.6	0.15	0.14	<0.05
KR ab.Shasta	KRASH	08/07/00	11:15	0.06	1.1	0.25	0.6	0.15	0.15	<0.05
KR ab.Shasta	KRASH	08/07/00	15:00	0.05	0.7	0.21	0.8	0.15	0.15	<0.05
KR ab.Shasta	KRASH	08/08/00	6:10	0.05	0.6	0.31	0.5	0.11	0.14	<0.05
KR ab.Shasta	KRASH	08/08/00	11:15	0.07	0.6	0.32	0.5	0.12	0.15	<0.05
KR ab.Shasta	KRASH	08/08/00	15:00	0.07	0.5	0.29	0.6	0.12	0.16	<0.05
KR ab.Shasta	KRASH	08/09/00	6:10	0.09	0.6	0.27	0.4	0.12	0.14	<0.05
KR ab.Shasta	KRASH	08/09/00	12:15	0.08	1.0	0.25	0.2	0.12	0.15	<0.05
KR ab.Shasta	KRASH	08/09/00	15:10	0.09	0.6	0.29	0.2	0.12	0.15	<0.05
				average	0.07	0.72	0.27	0.49	0.13	0.15
				minimum	0.05	0.50	0.21	0.20	0.11	0.14
				maximum	0.09	1.10	0.32	0.80	0.15	0.16
				median	0.07	0.60	0.27	0.50	0.12	0.15
				std. dev	0.015	0.205	0.037	0.196	0.016	0.007

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-5 Klamath River above Scott River synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv.
										Org P
KR ab. Scott	KRASC	06/05/00	6:40	0.07	0.8	<0.05	0.7	0.32	0.25	<0.05
KR ab.Scott	KRASC	06/05/00	12:20	0.34	0.6	<0.05	0.4	0.24	0.23	0.07
KR ab.Scott	KRASC	06/05/00	16:20	0.70	0.8	<0.05	0.8	0.25	0.23	0.06
KR ab.Scott	KRASC	06/06/00	6:45	<0.05	0.6	<0.05	0.7	0.38	0.25	0.1
KR ab.Scott	KRASC	06/06/00	12:00	0.15	0.7	<0.05	0.2	0.32	0.25	<0.05
KR ab.Scott	KRASC	06/06/00	15:15	<0.05	0.8	<0.05	0.8	0.31	0.26	<0.05
KR ab.Scott	KRASC	06/07/00	7:25	<0.05	0.6	<0.05	0.3	0.23	0.26	<0.05
KR ab.Scott	KRASC	06/07/00	11:20	<0.05	0.7	<0.05	0.2	0.25	0.25	<0.05
KR ab.Scott	KRASC	06/07/00	15:15	<0.05	1.0	<0.05	0.4	0.33	0.30	<0.05
				average	-	0.73	-	0.29	0.25	-
				minimum	<0.05	0.60	<0.05	0.20	0.23	0.23
				maximum	0.70	1.00	-	0.80	0.38	0.30
				median	-	0.70	-	0.40	0.31	0.25
				std. dev	-	0.132	-	0.250	0.051	0.021

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-6 Klamath River above Scott River synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv.
										Org P
KR ab.Scott	KRASC	08/07/00	6:50	0.08	0.8	0.16	0.3	0.15	0.14	<0.05
KR ab.Scott	KRASC	08/07/00	11:00	0.08	0.6	0.16	0.4	0.15	0.15	<0.05
KR ab.Scott	KRASC	08/07/00	15:25	0.05	0.8	0.15	0.2	0.17	0.25	<0.05
KR ab.Scott	KRASC	08/08/00	6:15	0.05	0.5	0.19	0.5	0.11	0.14	<0.05
KR ab.Scott	KRASC	08/08/00	11:00	0.05	0.4	0.30	0.2	0.12	0.14	<0.05
KR ab.Scott	KRASC	08/08/00	15:50	0.04	0.6	0.18	0.2	0.11	0.15	<0.05
KR ab.Scott	KRASC	08/09/00	6:15	0.09	0.5	0.2	0.2	0.11	0.14	<0.05
KR ab.Scott	KRASC	08/09/00	11:00	0.08	1.0	0.16	0.2	0.12	0.14	<0.05
KR ab.Scott	KRASC	08/09/00	15:15	0.10	1.0	0.15	0.3	0.12	0.14	<0.05
				average	0.07	0.69	0.18	0.28	0.13	0.15
				minimum	0.04	0.40	0.15	0.20	0.11	0.14
				maximum	0.10	1.00	0.30	0.50	0.17	0.25
				median	0.08	0.60	0.16	0.20	0.12	0.14
				std. dev	0.021	0.220	0.047	0.109	0.022	0.036

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-7 Klamath River near Seiad Valley synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR @ Seiad	KRSV	06/05/00	7:30	0.36	0.4	<0.05	0.4	0.27	0.21	<0.05
KR @ Seiad	KRSV	06/05/00	13:00	0.03	0.5	<0.05	0.5	0.20	0.18	<0.05
KR @ Seiad	KRSV	06/05/00	16:00	0.05	0.5	<0.05	0.4	0.22	0.20	<0.05
KR @ Seiad	KRSV	06/06/00	7:20	0.26	0.6	<0.05	0.6	0.27	0.23	<0.05
KR @ Seiad	KRSV	06/06/00	10:45	0.32	0.4	<0.05	0.5	0.19	0.16	0.09
KR @ Seiad	KRSV	06/06/00	14:30	0.27	0.4	<0.05	0.5	0.23	0.23	<0.05
KR @ Seiad	KRSV	06/07/00	6:30	0.04	0.6	<0.05	0.3	0.21	0.20	<0.05
KR @ Seiad	KRSV	06/07/00	10:30	0.08	0.6	<0.05	0.3	0.18	0.18	<0.05
KR @ Seiad	KRSV	06/07/00	14:30	0.11	0.5	<0.05	0.1	0.22	0.22	0.05
				average	0.17	0.50	-	0.22	0.20	-
				minimum	0.03	0.40	<0.05	0.10	0.18	0.16
				maximum	0.36	0.60	-	0.60	0.27	0.23
				median	0.11	0.50	-	0.40	0.22	0.20
				std. dev	0.132	0.087	-	0.150	0.032	0.024
Values in bold are estimated at or below the reporting limit (Organic const. not included)										
If more than 50% of the data are censored, values below the detection limit are not estimated.										

Table G-8 Klamath River near Seiad Valley synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻ + NO ₂ -	Dissolv. Org N	TP	PO ₄ ³⁻	Dissolv. Org P
				(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
KR @ Seiad	KRSV	08/07/00	7:45	0.08	0.8	0.13	0.4	0.16	0.13	<0.05
KR @ Seiad	KRSV	08/07/00	11:45	0.05	1.20	0.10	0.4	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/07/00	14:40	0.05	0.4	0.07	0.4	0.13	0.12	<0.05
KR @ Seiad	KRSV	08/08/00	7:30	0.04	0.7	0.14	0.4	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/08/00	12:00	0.06	0.4	0.11	0.4	0.11	0.12	<0.05
KR @ Seiad	KRSV	08/08/00	14:45	0.12	0.5	0.06	0.4	0.10	0.12	<0.05
KR @ Seiad	KRSV	08/09/00	7:10	0.08	0.2	0.16	0.3	0.11	0.13	<0.05
KR @ Seiad	KRSV	08/09/00	12:10	0.08	0.6	0.08	<0.2	0.11	0.12	<0.05
KR @ Seiad	KRSV	08/09/00	14:30	0.08	0.5	0.10	0.2	0.11	0.11	<0.05
				average	0.07	0.59	0.11	-	0.12	0.12
				minimum	0.04	0.20	0.06	<0.2	0.10	0.11
				maximum	0.12	1.20	0.16	0.40	0.16	0.13
				median	0.08	0.50	0.10	-	0.11	0.12
				std. dev	0.024	0.289	0.033	-	0.018	0.007
Values in bold are estimated at or below the reporting limit (Organic const. not included)										
If more than 50% of the data are censored, values below the detection limit are not estimated.										

Table G-9 Shasta River near mouth synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH_4^+	TKN	NO_3^- + NO_2^-	Dissolv.		PO_4^{3-}	Dissolv. Org P
							Org N	(mg/l)		
Shasta River	SHR1	06/05/00	6:30	0.05	0.5	<0.05	0.6	0.52	0.46	0.10
Shasta River	SHR2	06/05/00	11:45	0.08	0.5	<0.05	0.6	0.44	0.42	0.08
Shasta River	SHR3	06/05/00	15:15	0.34	0.5	<0.05	0.6	0.51	0.41	0.05
Shasta River	SHR4	06/06/00	6:30	0.02	0.6	<0.05	0.9	0.71	0.49	<0.05
Shasta River	SHR5	06/06/00	11:00	0.23	0.8	<0.05	0.7	0.61	0.48	0.21
Shasta River	SHR6	06/06/00	15:15	0.03	0.7	<0.05	0.7	0.56	0.56	<0.05
Shasta River	SHR7	06/07/00	10:00	0.12	0.8	<0.05	0.4	0.57	0.50	0.06
Shasta River	SHR8	06/07/00	11:30	0.09	0.6	<0.05	0.3	0.51	0.44	<0.05
Shasta River	SHR9	06/07/00	15:55	0.08	0.7	<0.05	0.3	0.50	0.50	0.05
				average	0.12	0.63	-	0.57	0.55	0.47
				minimum	0.02	0.50	<0.05	0.30	0.44	0.41
				maximum	0.34	0.80	-	0.90	0.71	0.56
				median	0.08	0.60	-	0.60	0.52	0.48
				std. dev	0.105	0.122	-	0.200	0.078	0.047

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-10 Shasta River near mouth synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH_4^+	TKN	NO_3^- + NO_2^-	Dissolv.		PO_4^{3-}	Dissolv. Org P
							Org N	(mg/l)		
Shasta River	SHR10	08/07/00	7:00	0.04	0.6	<0.05	0.5	0.18	0.22	<0.05
Shasta River	SHR11	08/07/00	10:45	0.05	1.0	<0.05	0.4	0.17	0.20	<0.05
Shasta River	SHR12	08/07/00	14:45	0.05	0.5	<0.05	0.4	0.18	0.20	<0.05
Shasta River	SHR13	08/08/00	6:40	0.05	0.3	<0.05	0.5	0.16	0.20	<0.05
Shasta River	SHR14	08/08/00	10:50	0.05	0.3	<0.05	0.3	0.15	0.20	<0.05
Shasta River	SHR15	08/08/00	14:45	0.05	0.4	<0.05	0.4	0.12	0.20	<0.05
Shasta River	SHR16	08/09/00	6:30	0.07	0.7	<0.05	0.3	0.20	0.25	<0.05
Shasta River	SHR17	08/09/00	12:00	0.06	0.6	<0.05	0.4	0.19	0.26	<0.05
Shasta River	SHR18	08/09/00	15:30	0.07	0.3	<0.05	0.2	0.21	0.25	<0.05
				average	0.05	0.52	-	0.38	0.17	0.22
				minimum	0.04	0.30	<0.05	0.20	0.12	0.20
				maximum	0.07	1.00	-	0.50	0.21	0.26
				median	0.05	0.50	-	0.40	0.18	0.20
				std. dev	0.010	0.233	-	0.097	0.028	0.026

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-11 Scott River near mouth synoptic survey water quality data, June 5-7, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻	Dissolv.	TP	PO ₄ ³⁻	Dissolv.
				(mg/l)	(mg/l)	(mg/l)	Org N	(mg/l)	(mg/l)	Org P
Scott River Mouth	SCR1	06/05/00	6:20	0.35	0.4	<0.05	0.4	0.14	0.10	<0.05
Scott River Mouth	SCR2	06/05/00	12:05	0.05	0.2	<0.05	0.3	0.15	0.13	<0.05
Scott River Mouth	SCR3	06/05/00	16:15	0.28	0.05	<0.05	0.4	0.14	0.09	<0.05
Scott River Mouth	SCR4	06/06/00	6:20	0.04	0.4	<0.05	0.6	0.26	0.10	<0.05
Scott River Mouth	SCR5	06/06/00	11:50	0.33	0.4	<0.05	0.5	0.13	0.11	<0.05
Scott River Mouth	SCR6	06/06/00	15:00	0.16	0.3	<0.05	0.5	0.18	0.13	<0.05
Scott River Mouth	SCR7	06/07/00	7:05	0.03	0.6	<0.05	<0.2	0.10	0.10	<0.05
Scott River Mouth	SCR8	06/07/00	11:35	0.10	0.3	<0.05	<0.2	0.18	0.12	<0.05
Scott River Mouth	SCR9	06/07/00	15:00	0.05	0.4	<0.05	0.2	0.15	0.15	<0.05
				average	0.15	0.34	-	0.16	0.11	-
				minimum	0.03	0.05	<0.05	<0.2	0.10	0.09
				maximum	0.35	0.60	-	0.60	0.26	0.15
				median	0.10	0.40	-	-	0.15	0.11
				std. dev	0.131	0.154	-	-	0.045	0.019

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

Table G-12 Scott River near mouth synoptic survey water quality data, August 7-9, 2000

SITE	SITE	Date	Time	NH ₄ ⁺	TKN	NO ₃ ⁻	Dissolv.	TP	PO ₄ ³⁻	Dissolv.
				(mg/l)	(mg/l)	(mg/l)	Org N	(mg/l)	(mg/l)	Org P
Scott River Mouth	SCR10	08/07/00	6:35	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR11	08/07/00	11:15	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR12	08/07/00	15:10	<0.05	<0.2	<0.05	<0.2	0.05	<0.05	<0.05
Scott River Mouth	SCR13	08/08/00	6:45	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR14	08/08/00	11:30	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR15	08/08/00	15:30	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR16	08/09/00	6:30	0.06	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR17	08/09/00	11:20	<0.05	0.2	<0.05	<0.2	<0.05	<0.05	<0.05
Scott River Mouth	SCR18	08/09/00	15:00	<0.05	<0.2	<0.05	<0.2	<0.05	<0.05	<0.05
				average	-	-	-	-	-	-
				minimum	0.06	<0.2	<0.05	<0.2	<0.05	<0.05
				maximum	0.06	0.20	-	-	0.05	-
				median	-	-	-	-	-	-
				std. dev	-	-	-	-	-	-

Values in bold are estimated at or below the reporting limit (Organic const. not included)

If more than 50% of the data are censored, values below the detection limit are not estimated.

H SYNOPTIC SURVEY DATA: GRAPHICAL PRESENTATION BY SITE

Synoptic survey data were processes in a similar manner to other grab sample data. Points below the detection limit were estimated by fitting a least squares regression to a log-normal plot of available data. More than fifty percent of the data were required to complete these estimations (i.e., maximum missing data points was less than or equal to four). Estimated points are depicted by an open symbol. At certain sampling stations all data were below the reporting limit. If less than two data points were available, a plot was not provided. (Nitrate refers to nitrate+nitrite)

June 5-7, 2000 Synoptic

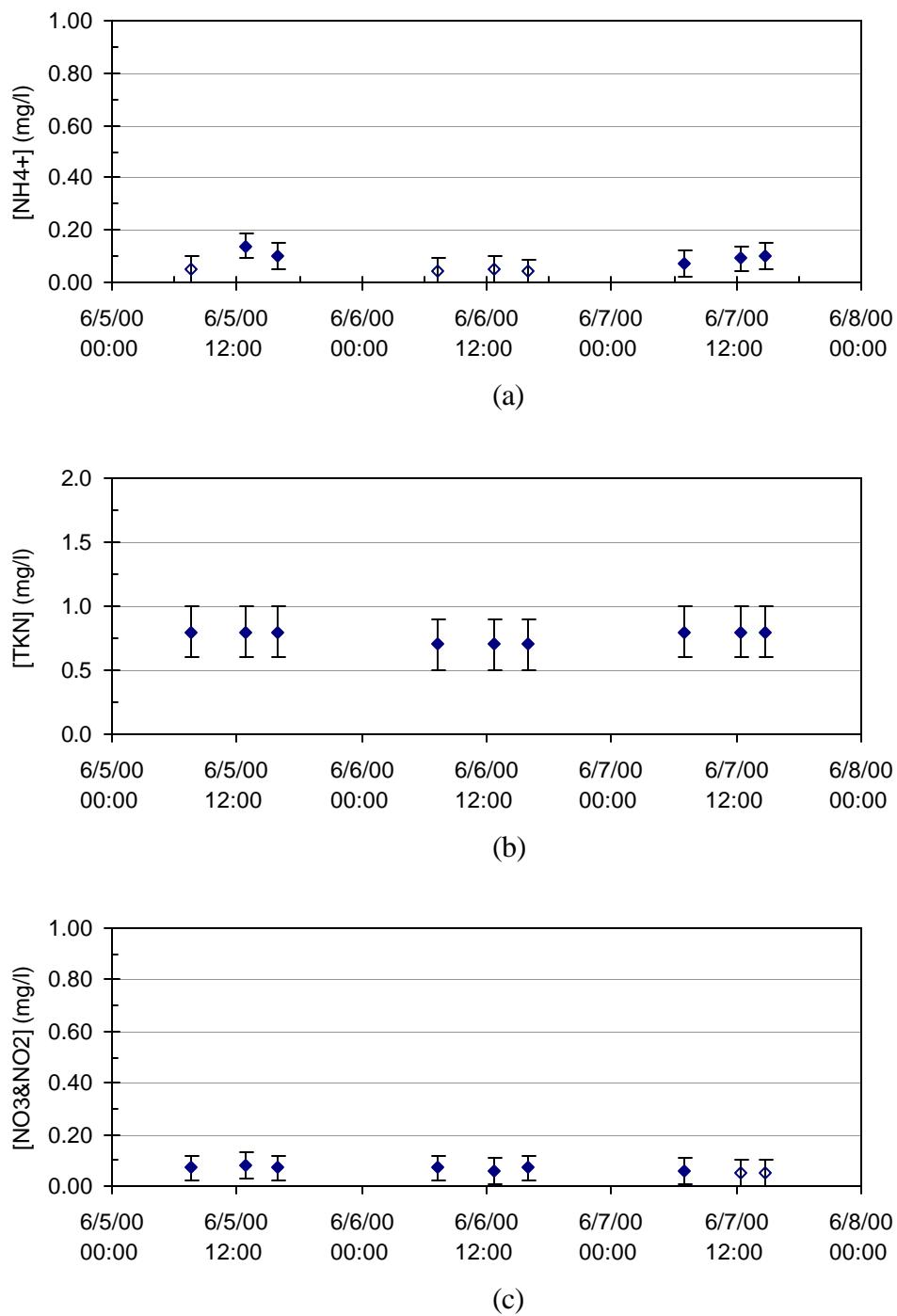
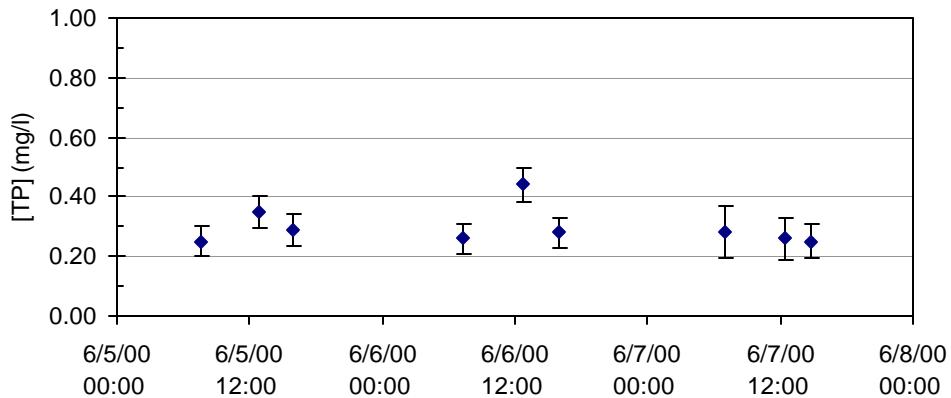
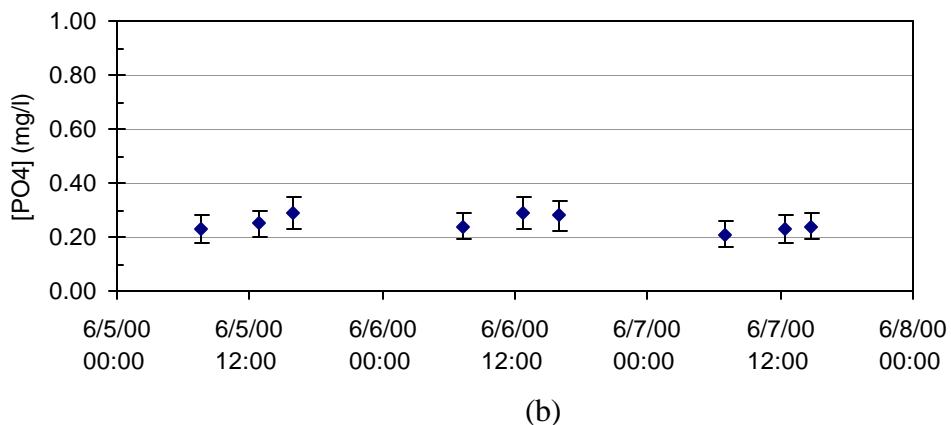


Figure H-1 Klamath River below Iron Gate Dam, synoptic grab samples – June 5-7, 2000:
(a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

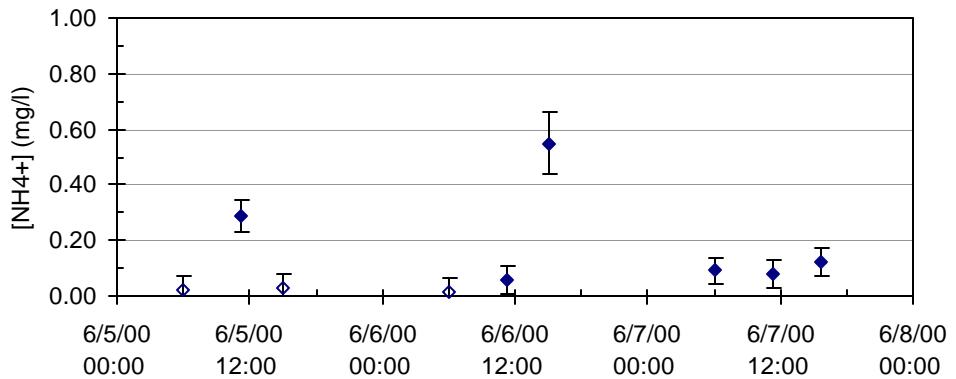


(a)

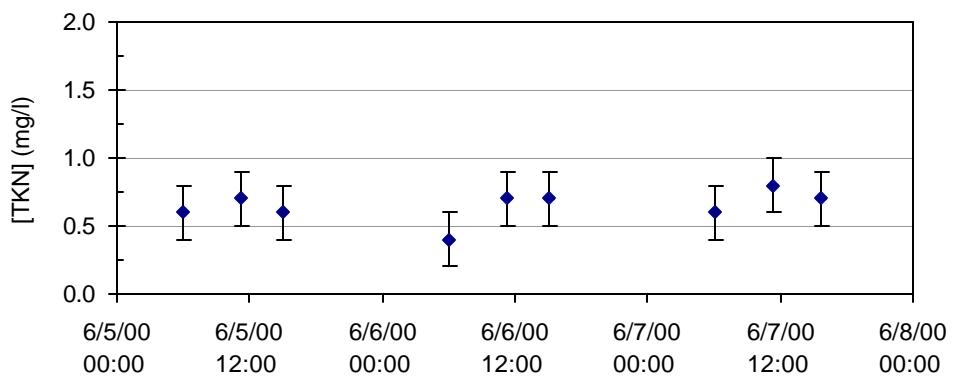


(b)

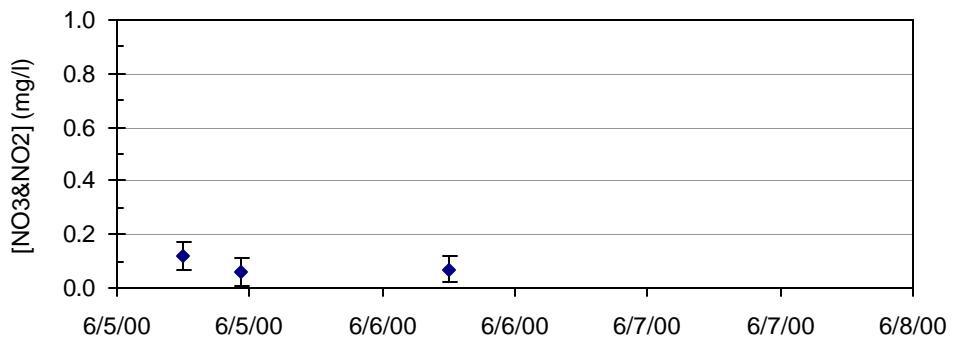
Figure H-2 Klamath River below Iron Gate Dam synoptic grab samples – June 5-7, 2000:
(a) total phosphorous, (b) orthophosphate



(a)

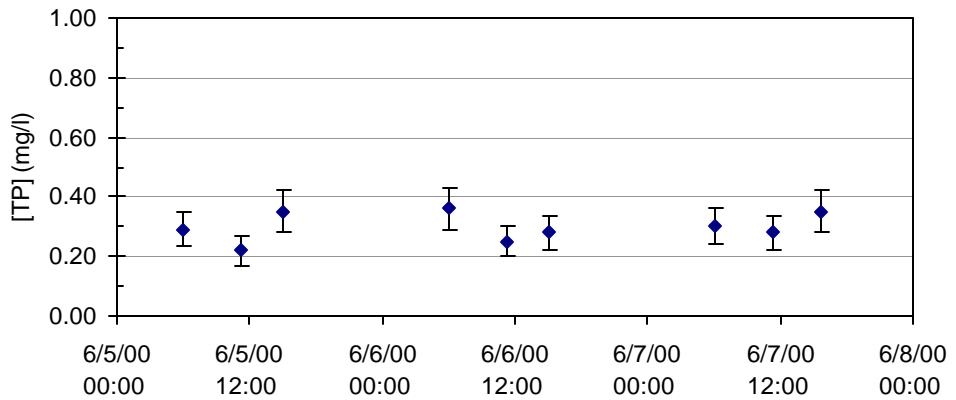


(b)

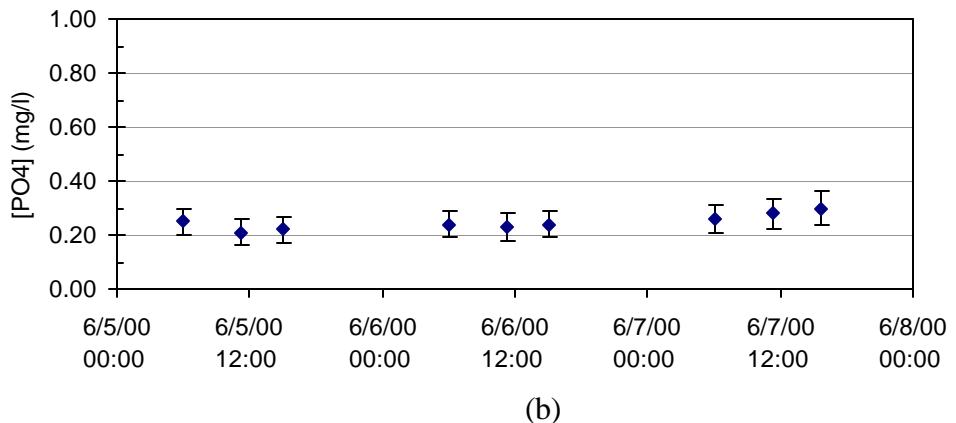


(c)

Figure H-3 Klamath River above Shasta River synoptic grab samples – June 5-7, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

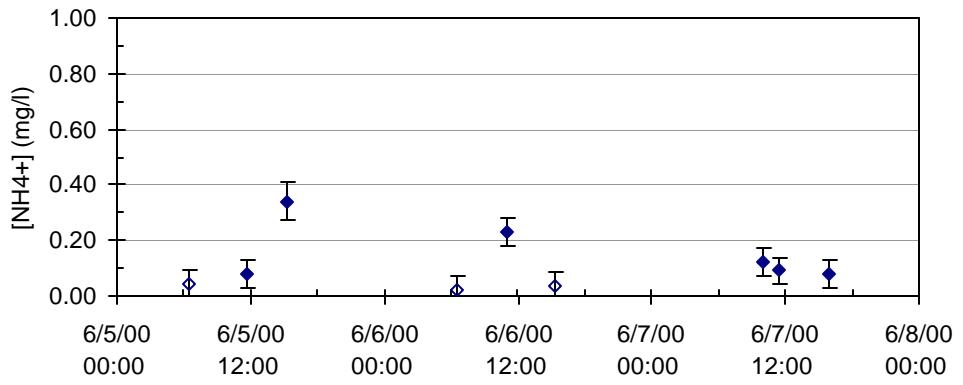


(a)

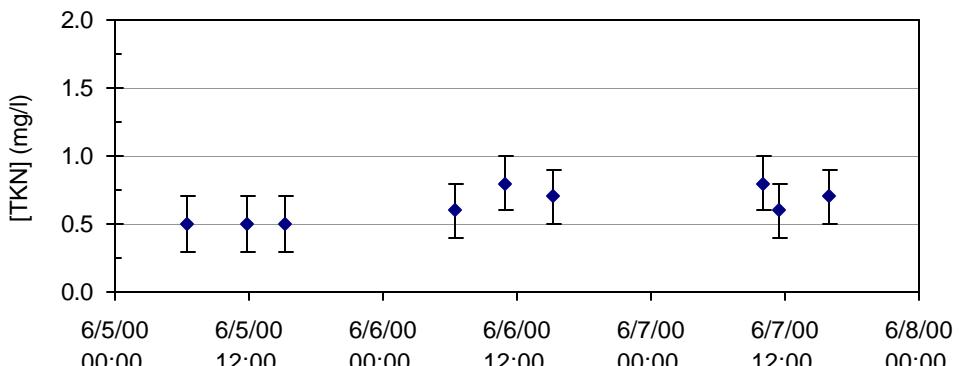


(b)

Figure H-4 Klamath River above Shasta River synoptic grab samples – June 5-7, 2000: (a) total phosphorous, (b) orthophosphate



(a)

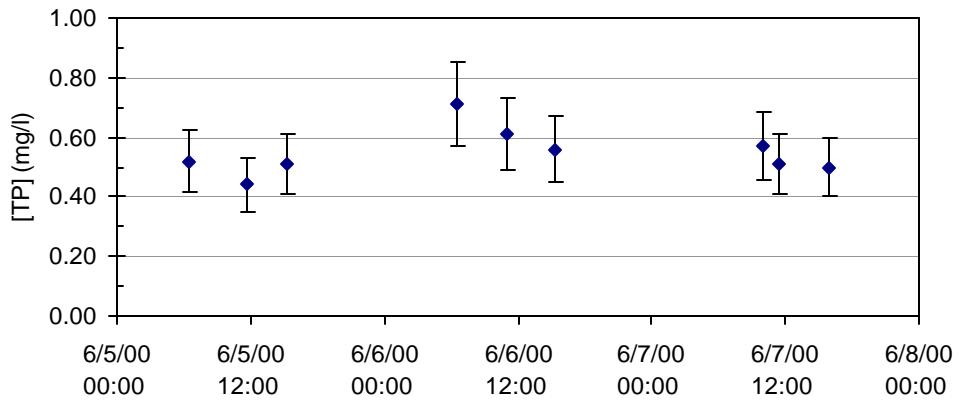


(b)

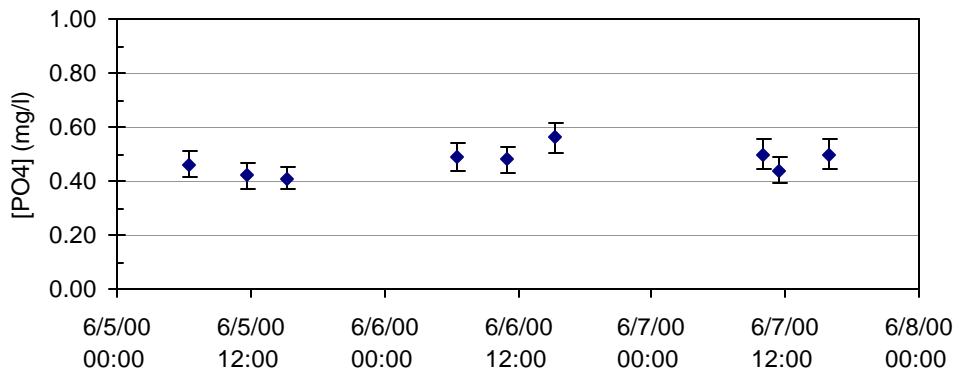
[less than Reporting Limit]

(c)

Figure H-5 Shasta River synoptic grab samples – June 5-7, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

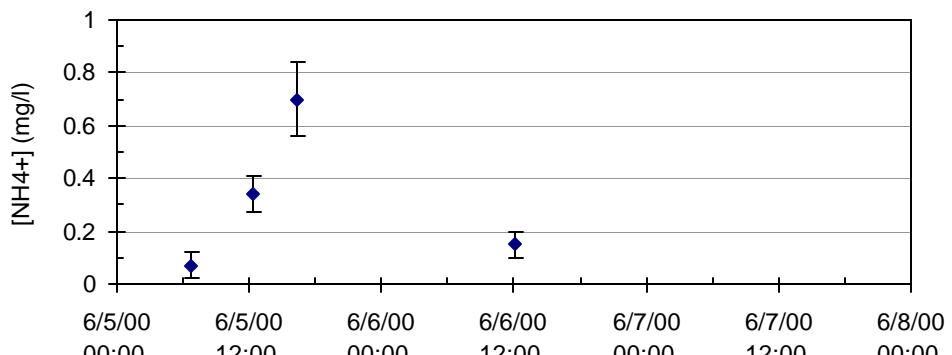


(a)

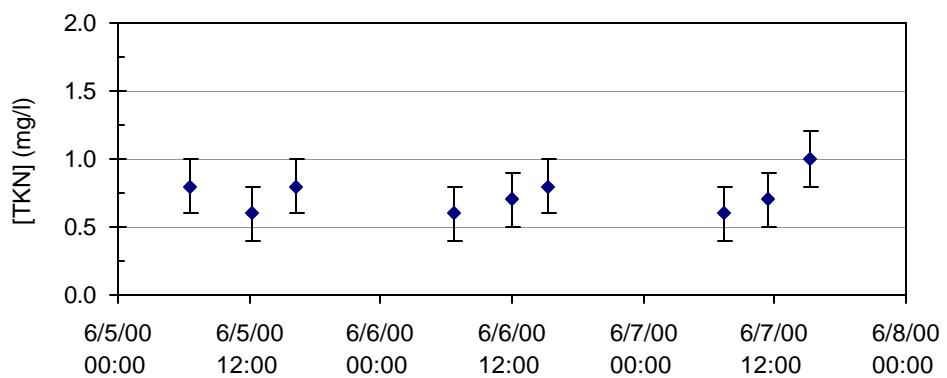


(b)

Figure H-6 Shasta River synoptic grab samples – June 5-7, 2000: (a) total phosphorous, (b) orthophosphate



(a)

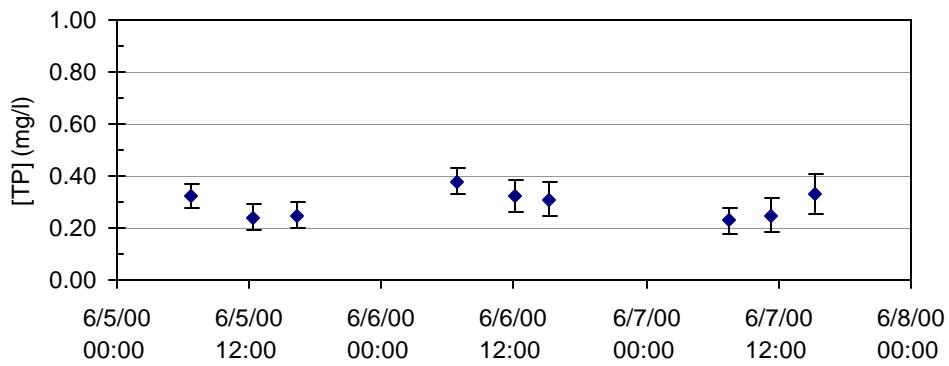


(b)

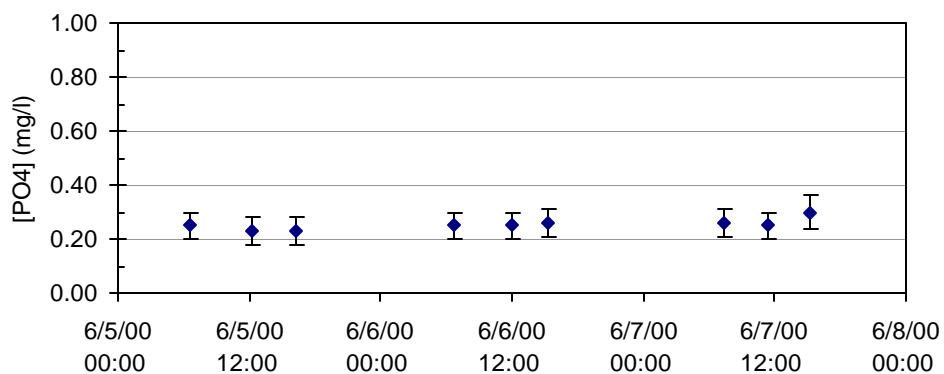
[less than Reporting Limit]

(c)

Figure H-7 Klamath River above Scott River synoptic grab samples – June 5-7, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

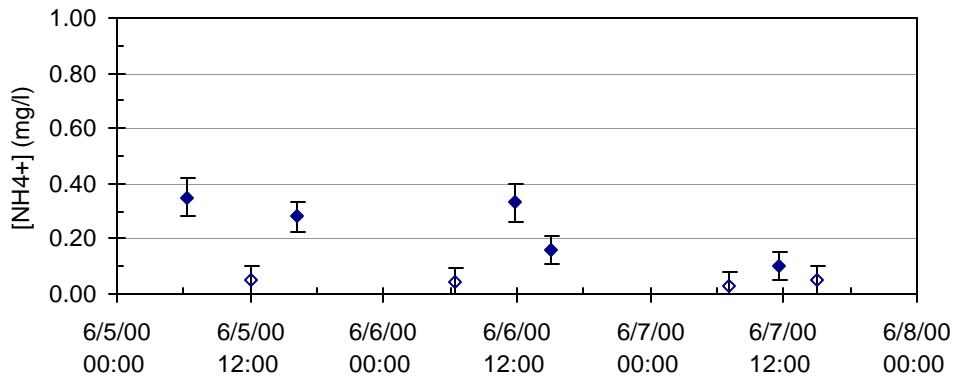


(a)

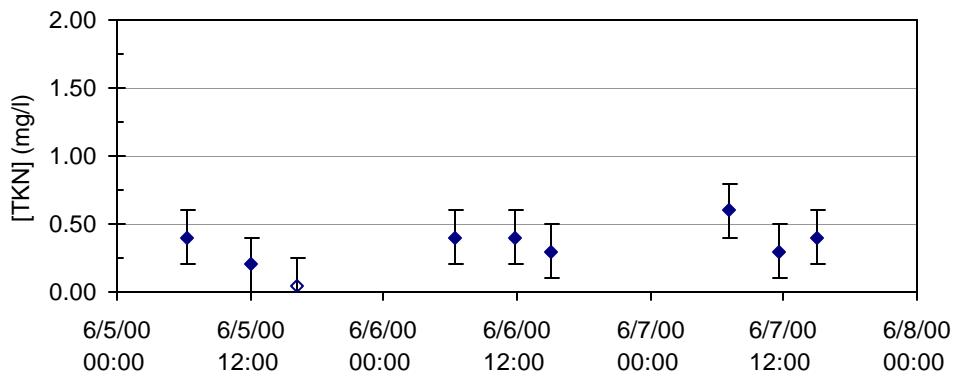


(b)

Figure H-8 Klamath River above Scott River synoptic grab samples – June 5-7, 2000: (a) total phosphorous, (b) orthophosphate



(a)

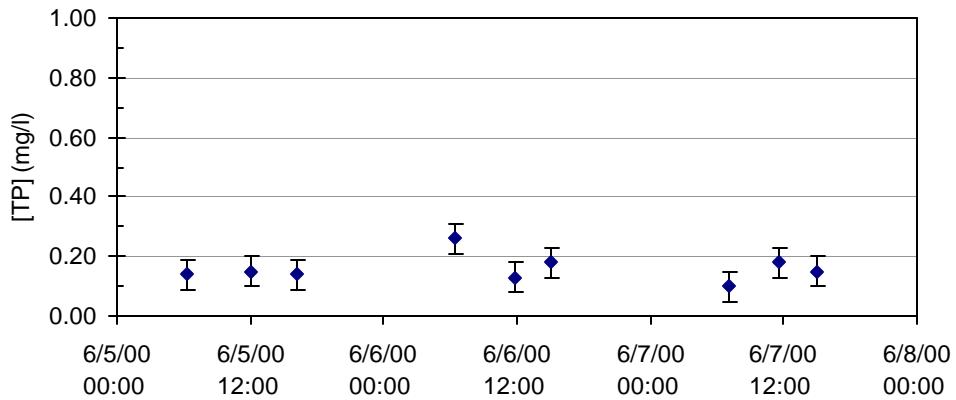


(b)

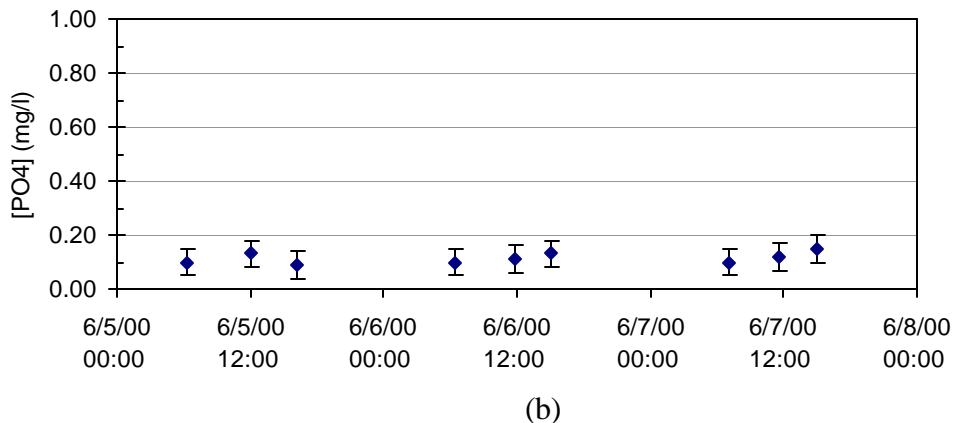
[less than Reporting Limit]

(c)

Figure H-9 Scott River (mouth) synoptic grab samples – June 5-7, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

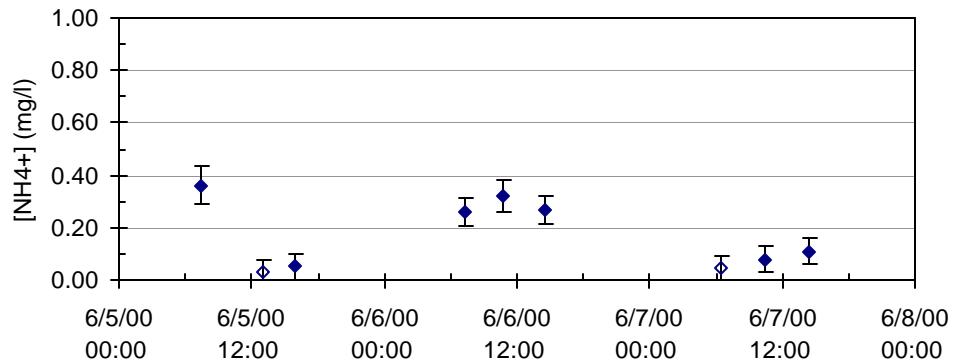


(a)

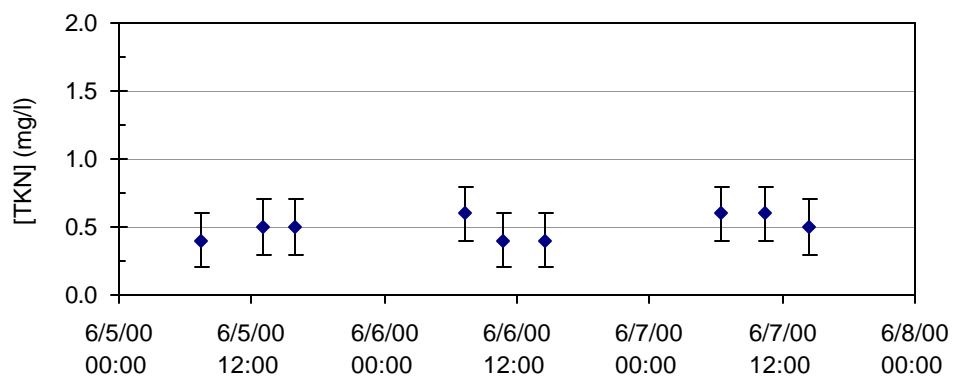


(b)

Figure H-10 Scott River (mouth) synoptic grab samples – June 5-7, 2000: (a) total phosphorous, (b) orthophosphate



(a)

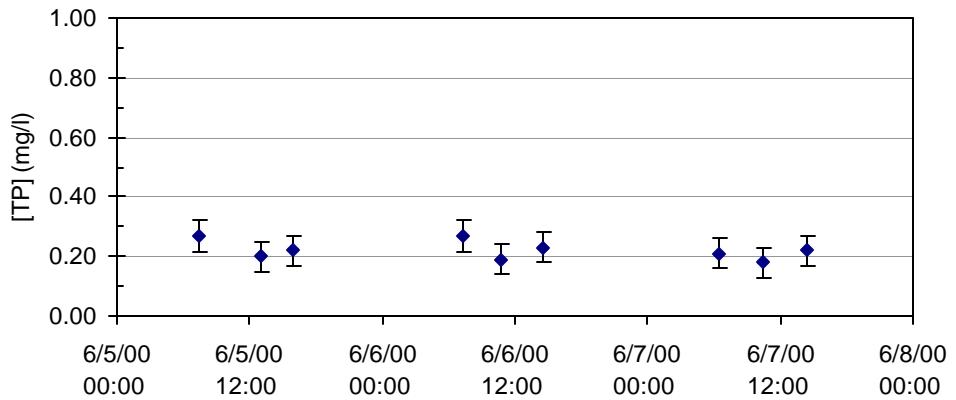


(b)

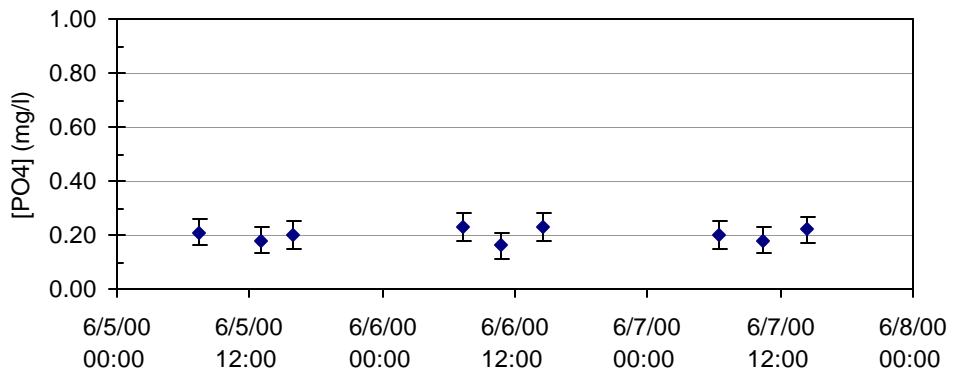
[less than Reporting Limit]

(c)

Figure H-11 Klamath River near Seiad Valley synoptic grab samples – June 5-7, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate



(a)



(b)

Figure H-12 Klamath River near Seiad Valley synoptic grab samples – June 5-7, 2000: (a) total phosphorous, (b) orthophosphate

August 7-9, 2000 Synoptic

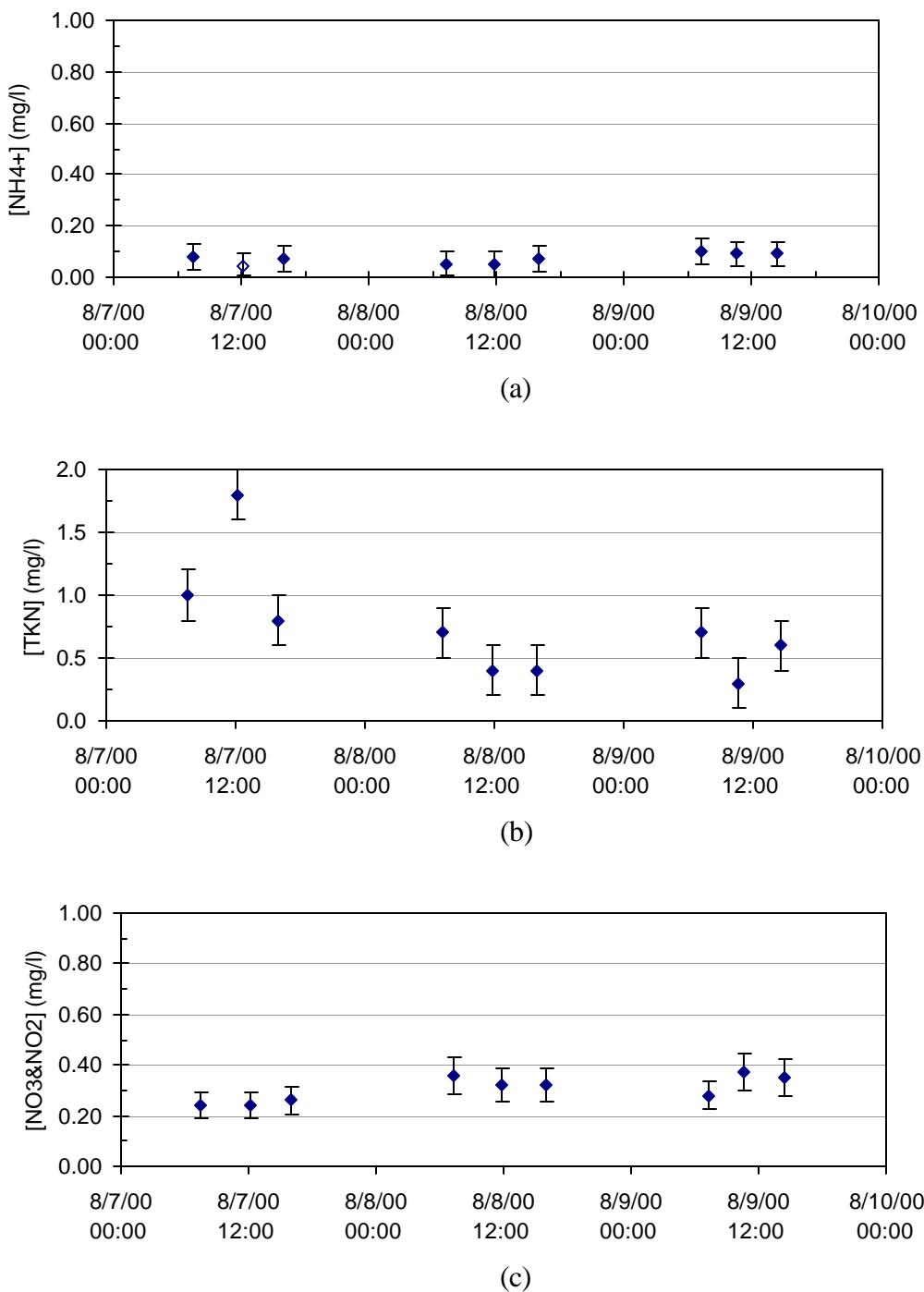
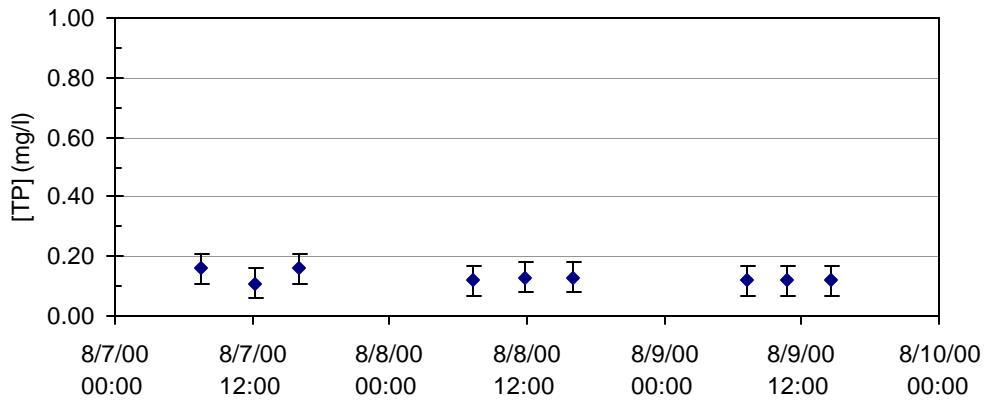
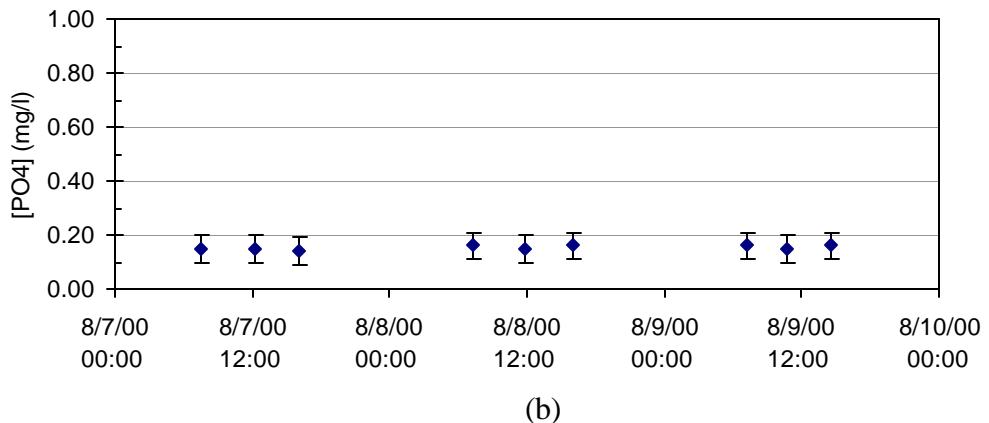


Figure H-13 Klamath River below Iron Gate Dam, synoptic grab samples – August 7-9, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

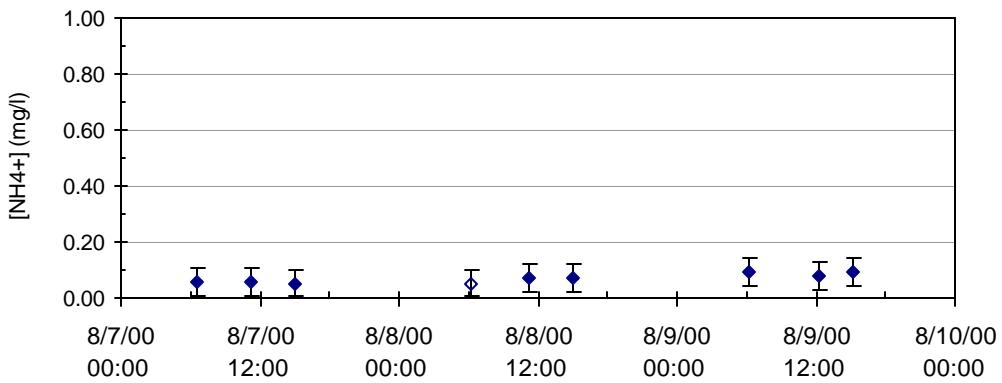


(a)

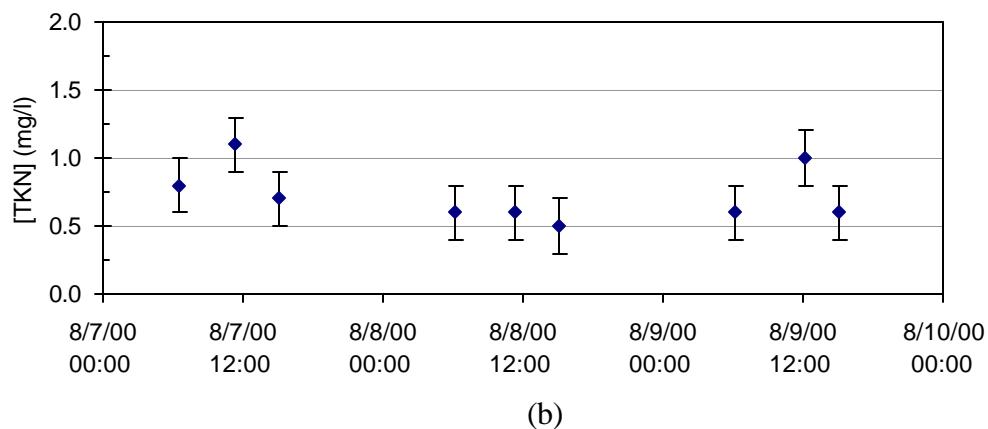


(b)

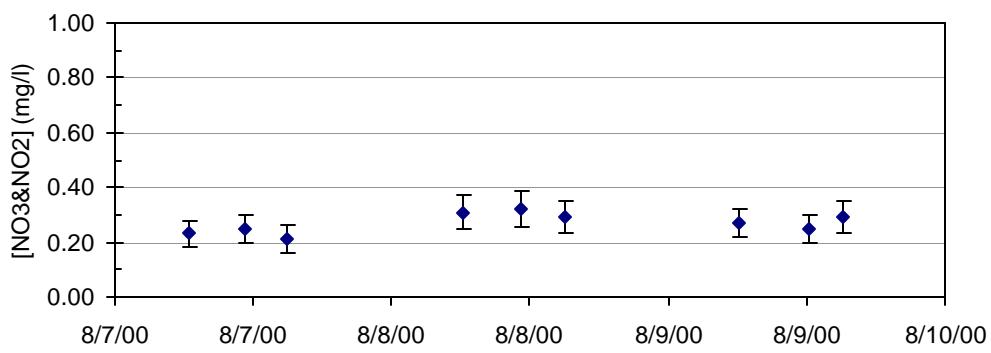
Figure H-14 Klamath River below Iron Gate Dam synoptic grab samples – August 7-9, 2000: (a) total phosphorous, (b) orthophosphate



(a)

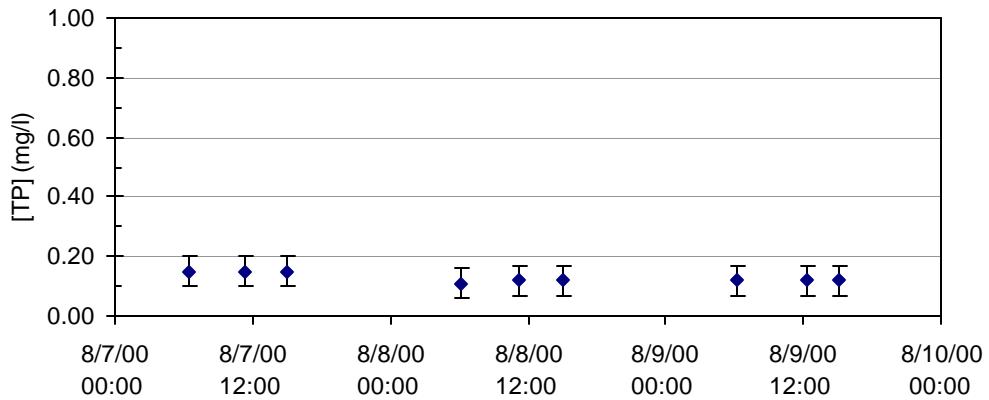


(b)

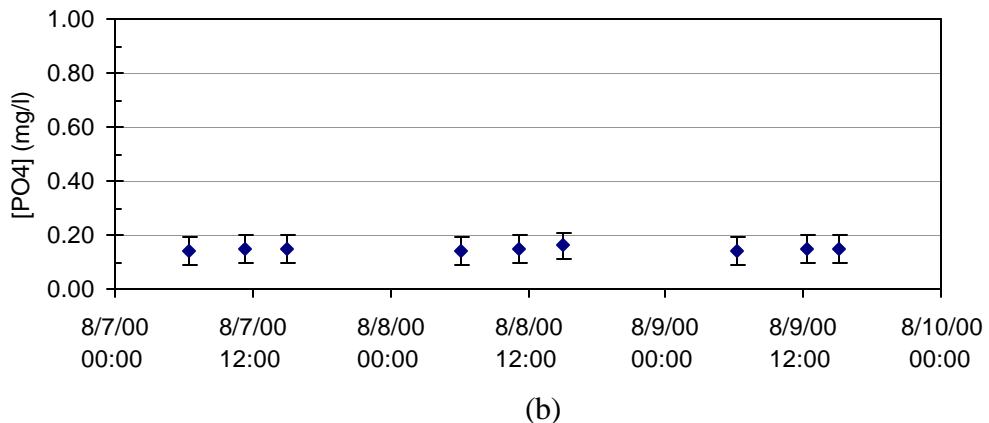


(c)

Figure H-15 Klamath River above Shasta River synoptic grab samples – August 7-9, 2000:
(a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

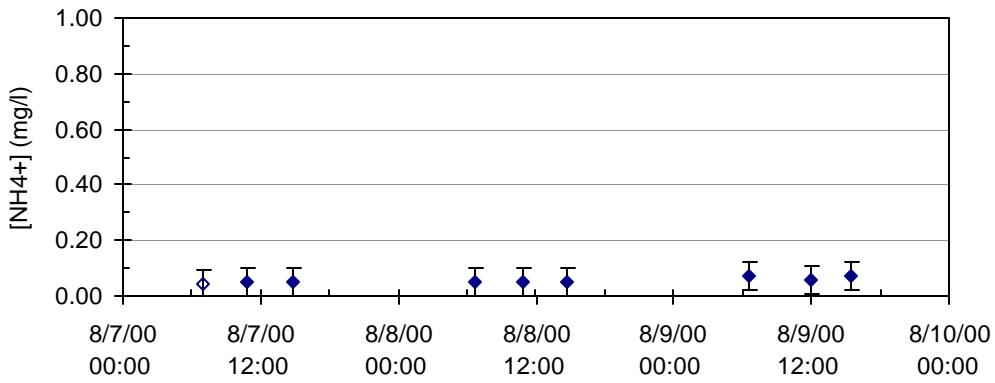


(a)

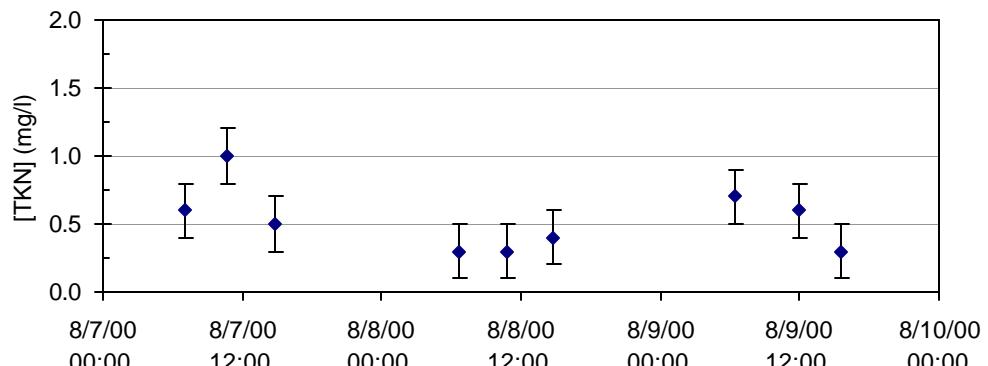


(b)

Figure H-16 Klamath River above Shasta River synoptic grab samples – August 7-9, 2000:
(a) total phosphorous, (b) orthophosphate



(a)

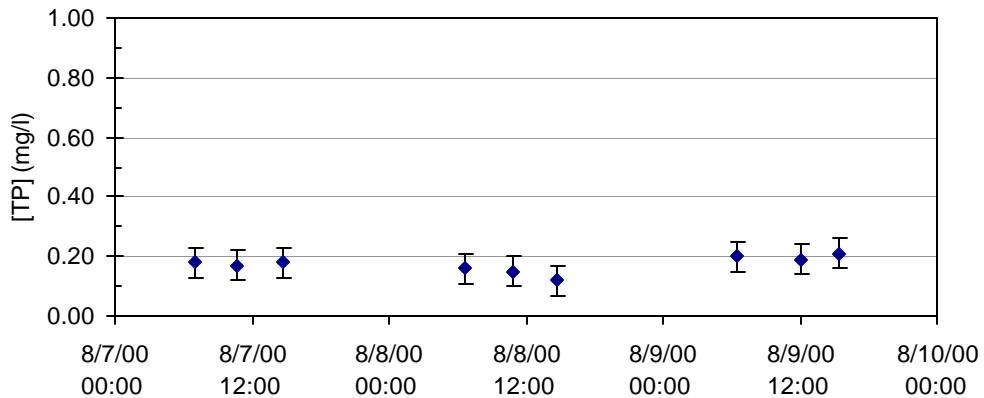


(b)

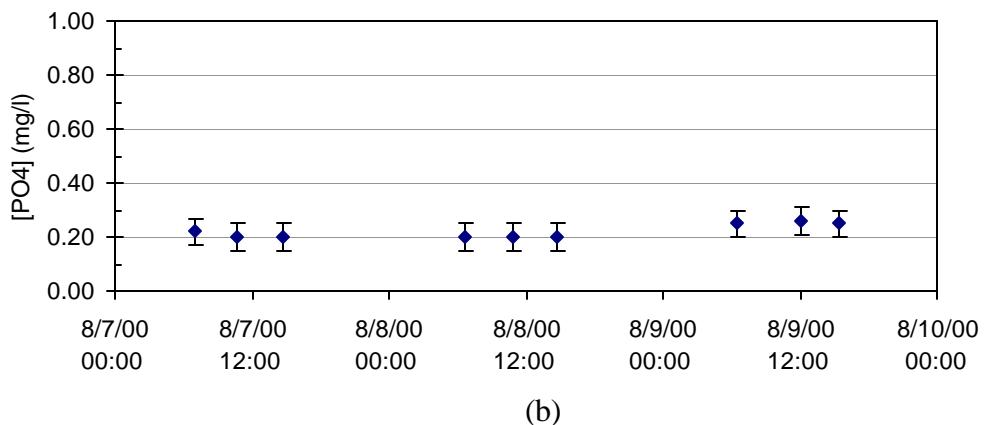
[less than Reporting Limit]

(c)

Figure H-17 Shasta River synoptic grab samples – August 7-9, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

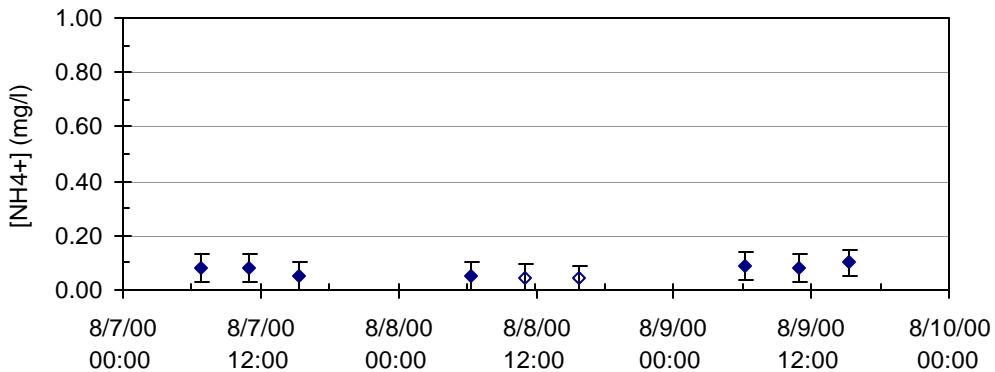


(a)

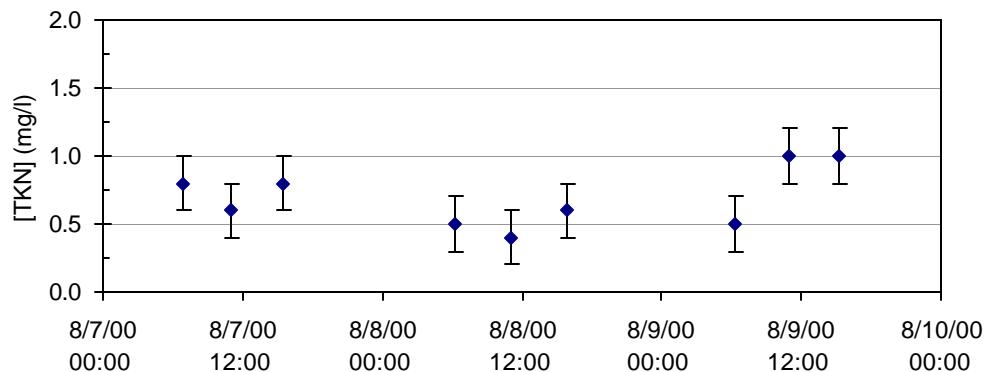


(b)

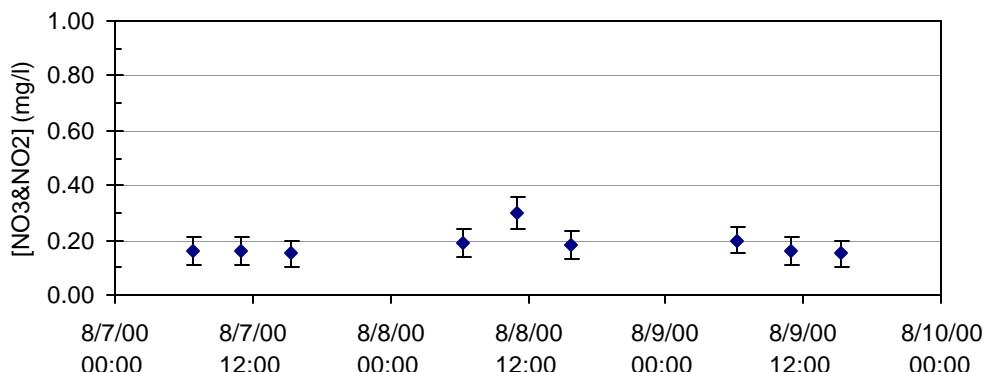
Figure H-18 Shasta River synoptic grab samples – August 7-9, 2000: (a) total phosphorous, (b) orthophosphate



(a)

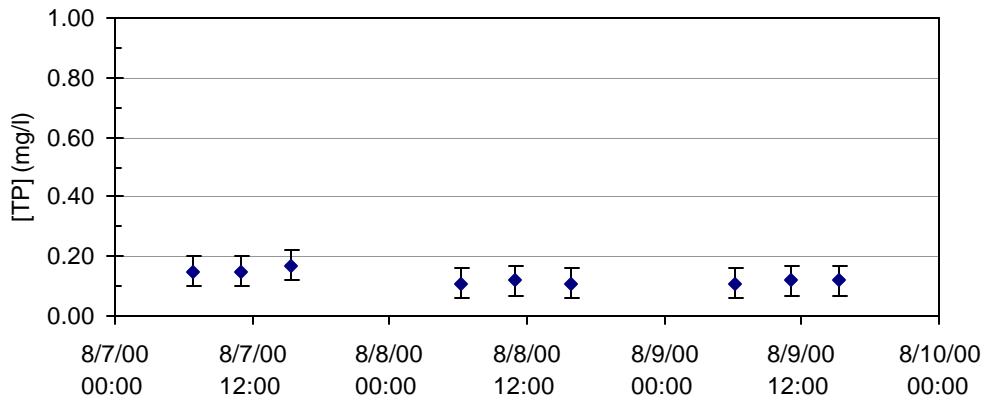


(b)

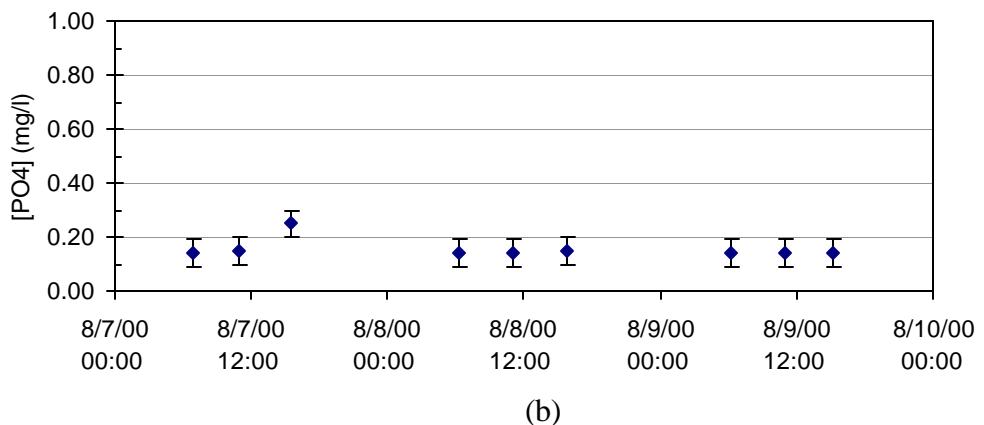


(c)

Figure H-19 Klamath River above Scott River synoptic grab samples – August 7-9, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate



(a)



(b)

Figure H-20 Klamath River above Scott River synoptic grab samples – August 7-9, 2000: (a) total phosphorous, (b) orthophosphate

[one data point]
(a)

[one data point]
(b)

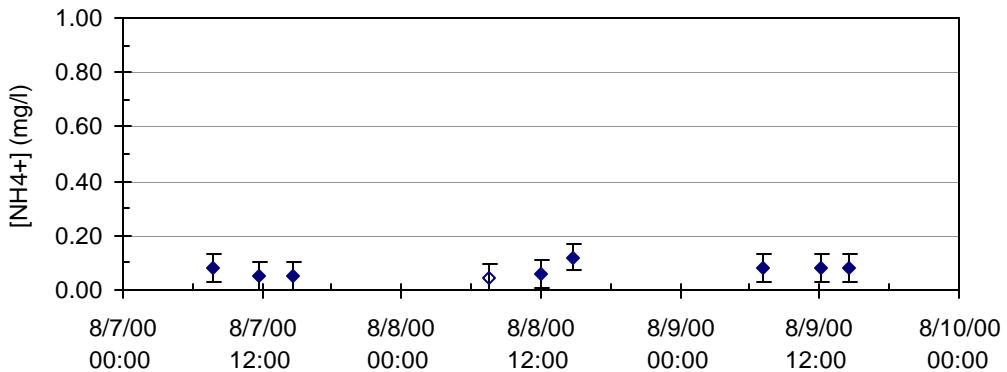
[less than Reporting Limit]
(c)

Figure H-21 Scott River (mouth) synoptic grab samples – August 7-9, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate

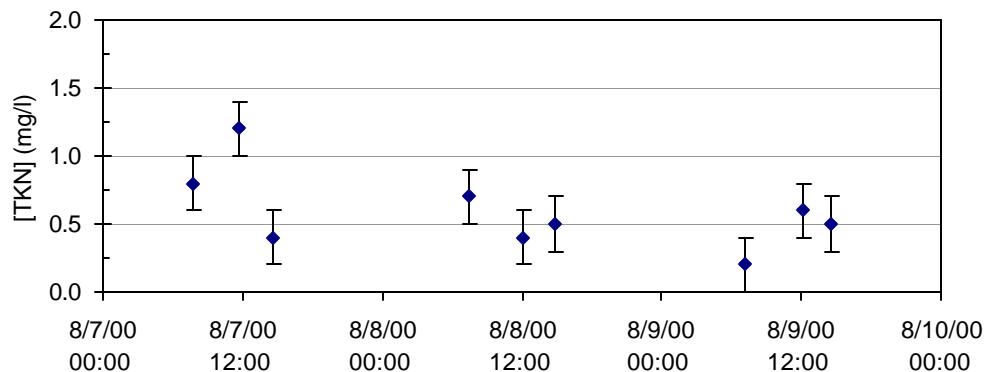
[one data point]
(a)

[less than Reporting Limit]
(b)

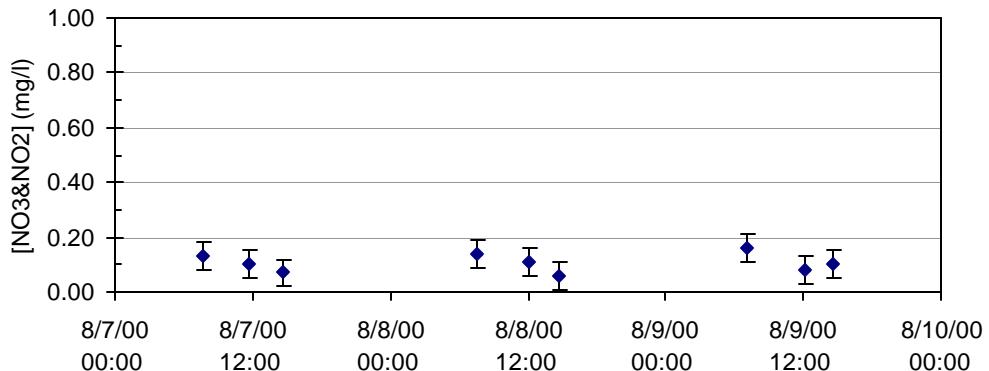
Figure H-22 Scott River (mouth) synoptic grab samples – August 7-9, 2000: (a) total phosphorous, (b) orthophosphate



(a)

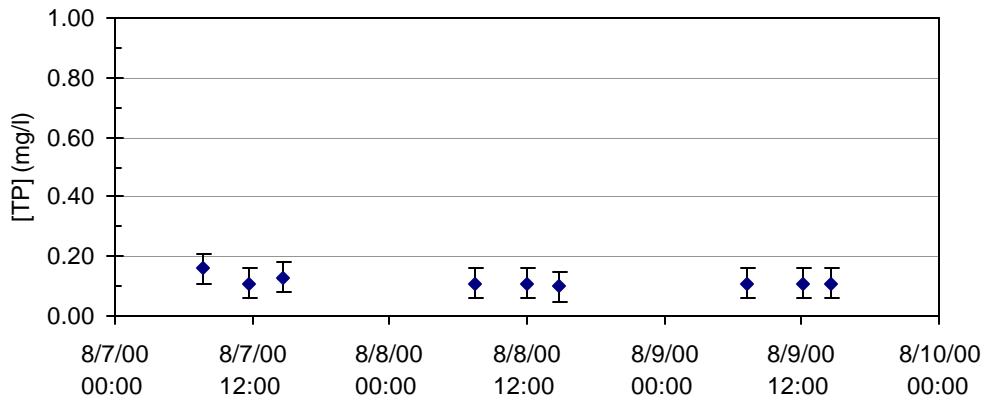


(b)

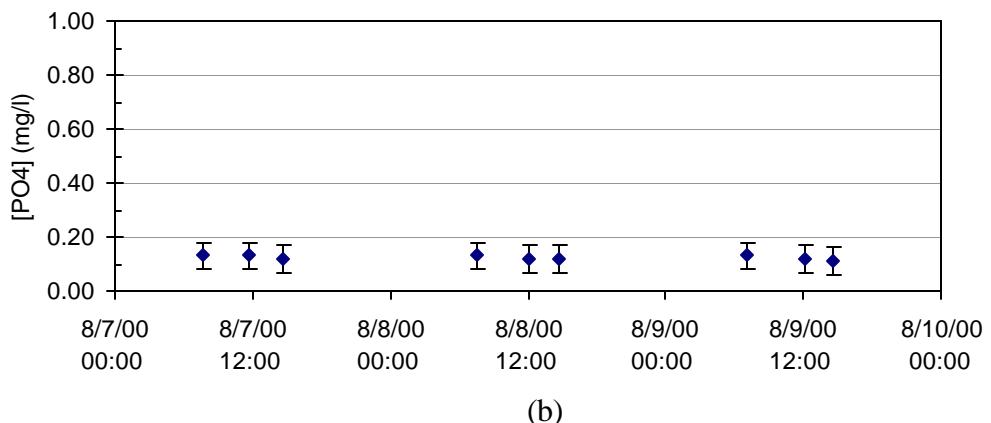


(c)

Figure H-23 Klamath River near Seiad Valley synoptic grab samples – August 7-9, 2000: (a) ammonia, (b) total Kjeldahl nitrogen, and (c) nitrate



(a)



(b)

Figure H-24 Klamath River near Seiad Valley synoptic grab samples – August 7-9, 2000: (a) total phosphorous, (b) orthophosphate

I SYNOPTIC SURVEY: DATASONDE RECORDS

During the synoptic surveys, datasonde (sondes) water quality probes were deployed at each sample location. These sondes recorded water temperature, pH, specific conductance, and dissolved oxygen. As noted above, two synoptic grab sampling surveys were completed: June 5-7 and August 7-9, 2000. A third synoptic using only water quality probes was completed on September 27-29, 2000. The data from these three sampling events is included herein. Beyond occasional missing data points due to sonde failure or data lost during replacement, the sonde above the Scott River for the June 5-7, 2000 deployment failed and all data were lost. Sonde recorded dissolved oxygen concentrations may suffer from biofouling. Instruments deployed at the

- Klamath River above the Shasta River
- Klamath River above the Shasta River
- Scott River (mouth)

show little impact of biofouling because they were only deployed for the periods when synoptic sampling was occurring. Probes at the remaining sites,

- Klamath River below Iron Gate Dam
- Shasta River
- Scott River at Ft. Jones
- Klamath River near Seiad Valley

show variable levels of biofouling. Both dissolved oxygen in mg/l and percent saturation are presented in the following graphs (percent saturation is represented by a dashed line). Approximate sampling times for the June and August synoptic grab samples are shown on the graphs where applicable. For exact times refer to Appendix G.

Water temperature and dissolved oxygen data for June 5, 2000 for the Klamath River above the Scott River, the Scott River, and the USGS gage near Seiad Valley were collected with an Enviro-Safe® thermometer and a YSI model number 51B dissolved oxygen meter. This was primarily done because there was no DataSonde available for the Scott River location until the early afternoon. These spot measurements are summarized below.

Location	Time	Temperature (°C)	Dissolved Oxygen (mg/l)
Klamath River above Scott River	6/5/00 8:40	17.5	8.6
Scott River	6/5/00 6:20	14.0	10.8
Klamath River at USGS near Seiad Valley	6/5/00 8:40	16.2	9.8
Klamath River above Scott River	6/5/00 12:05	18.1	9.2
Scott River	6/5/00 6:20	15.2	10.8
Klamath River at USGS near Seiad Valley	6/5/00 8:40	n/a	n/a

Synoptic Survey June 5-7, 2000

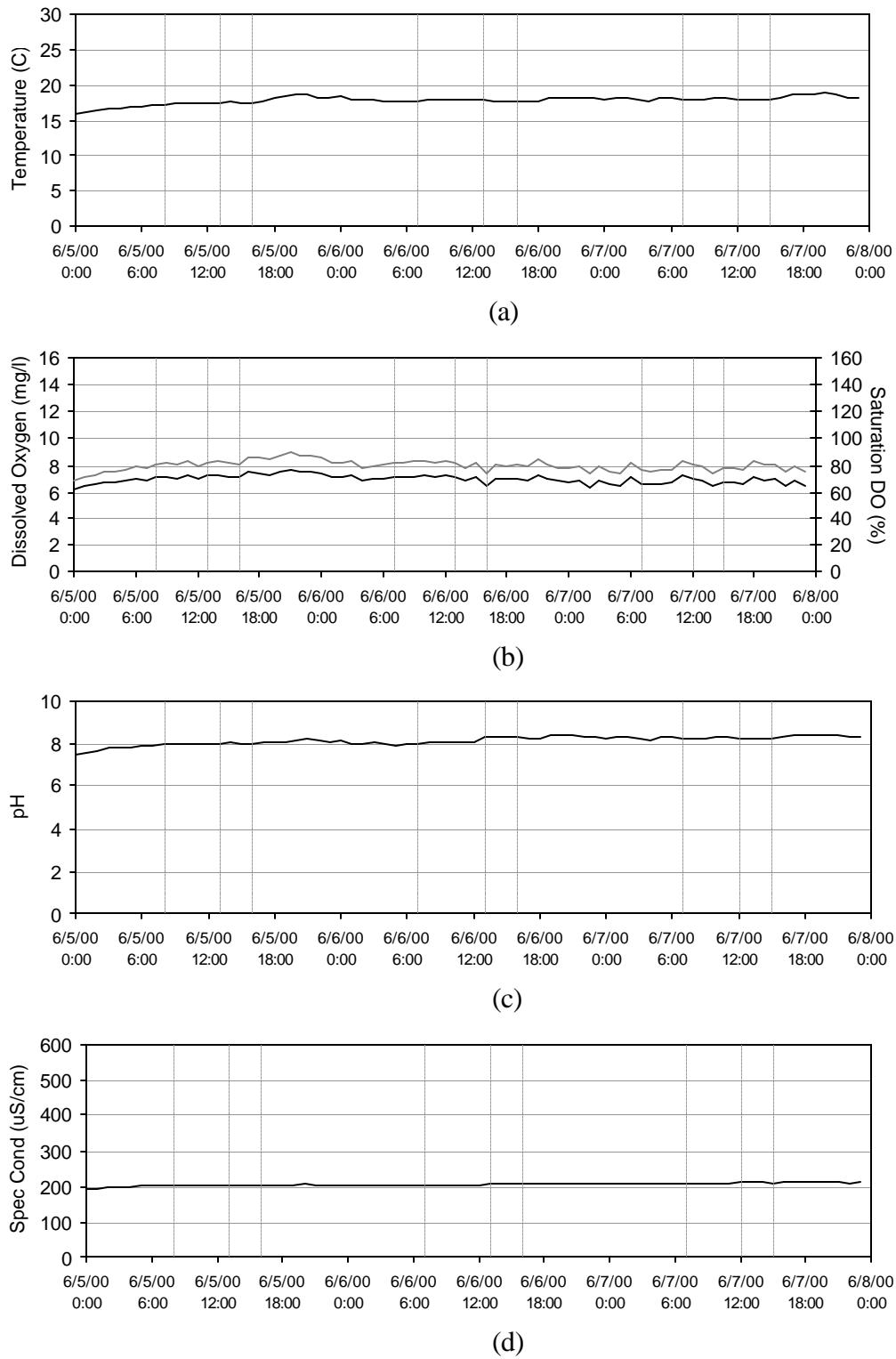
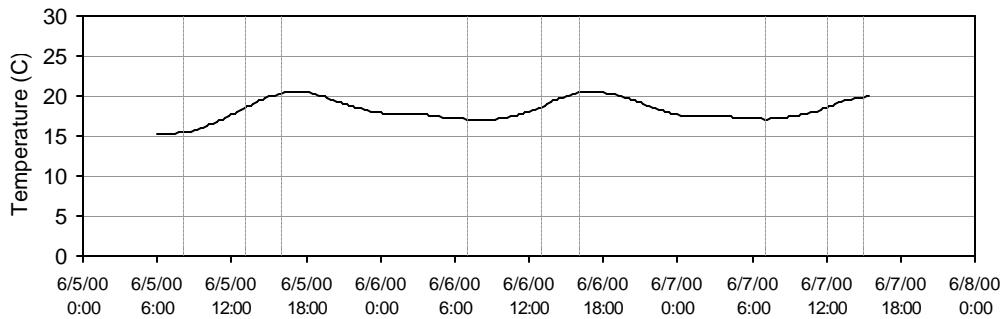
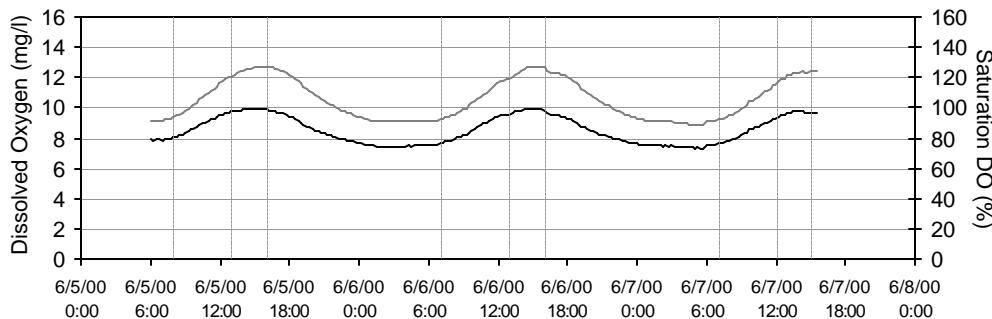


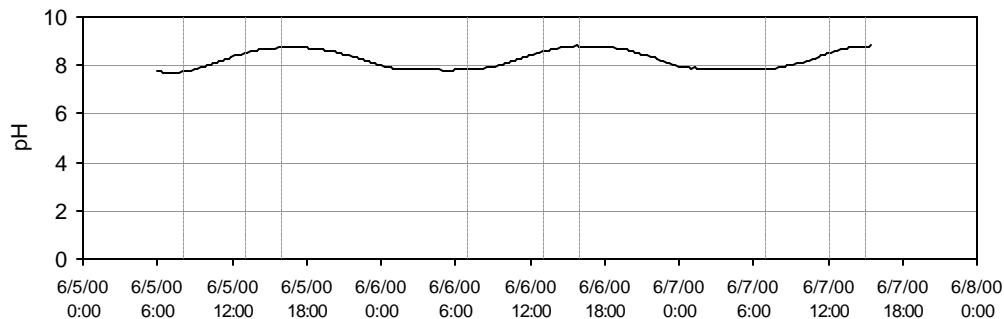
Figure I-1 Klamath River below Iron Gate Dam, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



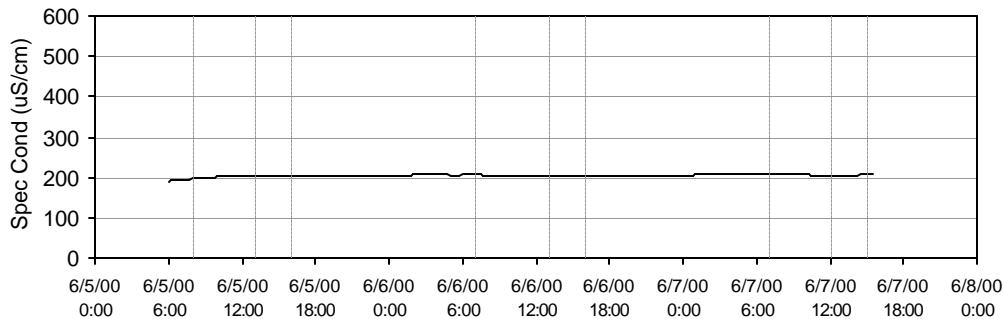
(a)



(b)

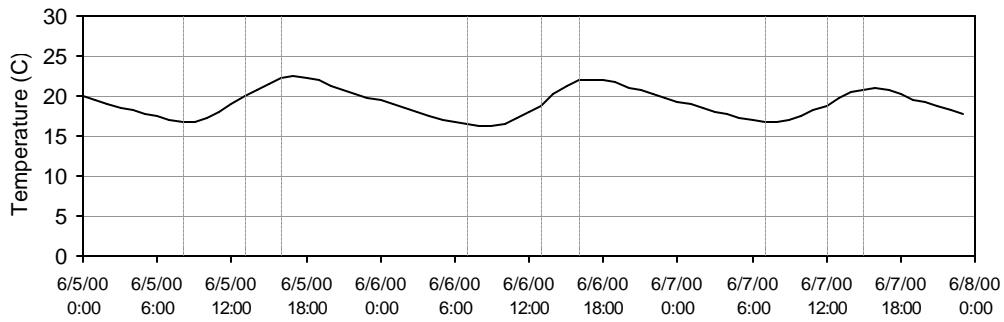


(c)

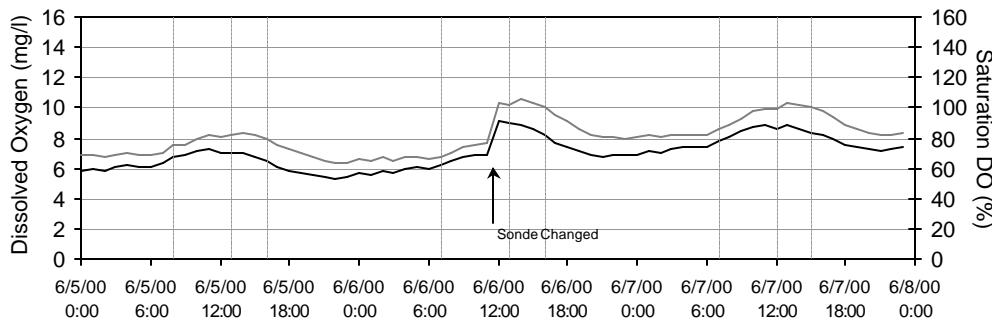


(d)

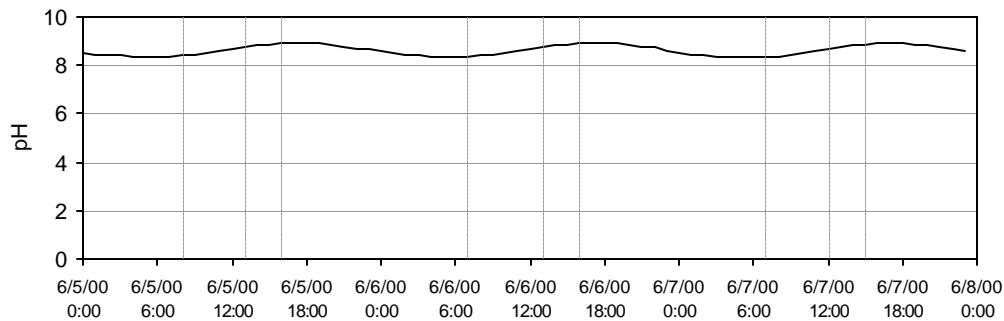
Figure I-2 Klamath River above Shasta River, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



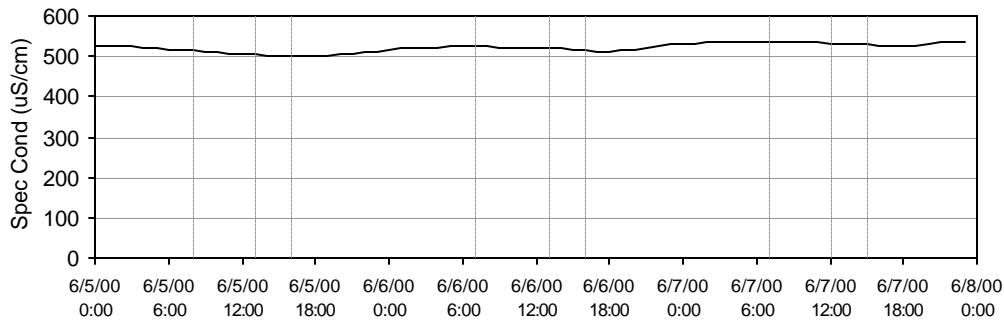
(a)



(b)



(c)



(d)

Figure I-3 Shasta River, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

[No Data]

(a)

[No Data]

(b)

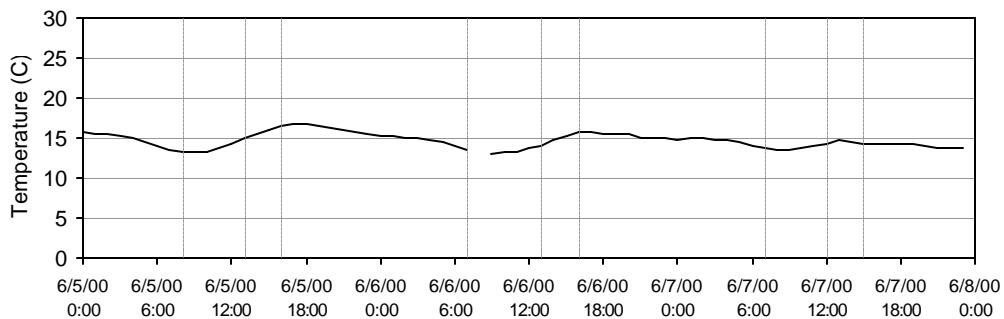
[No Data]

(c)

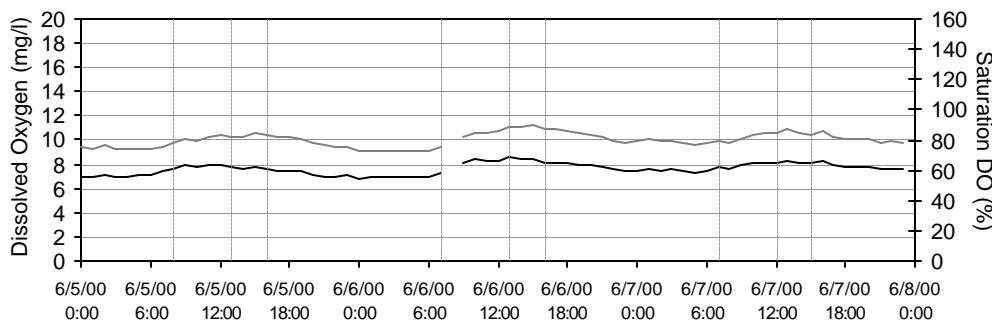
[No Data]

(d)

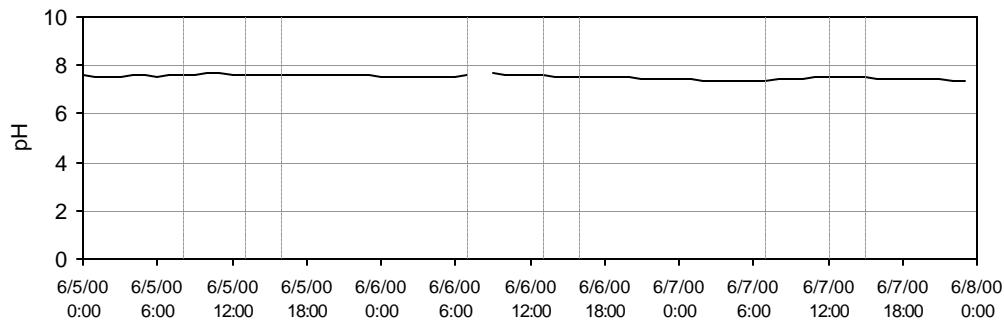
Figure I-4 Klamath River above Scott River, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



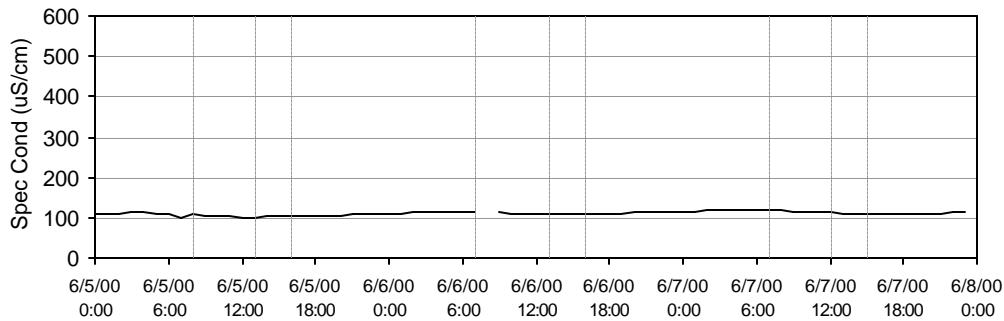
(a)



(b)

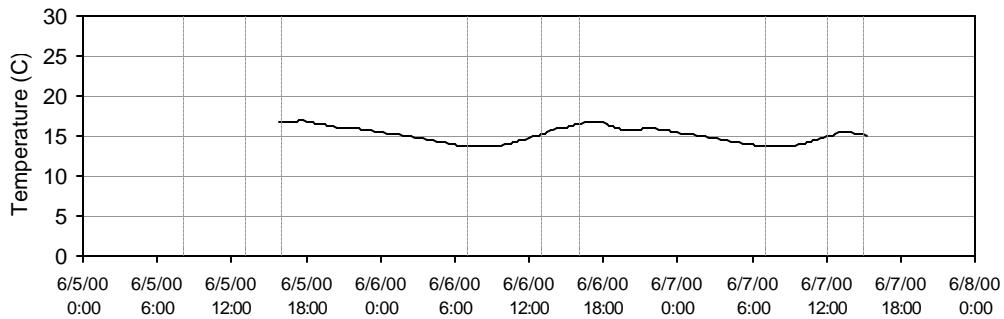


(c)

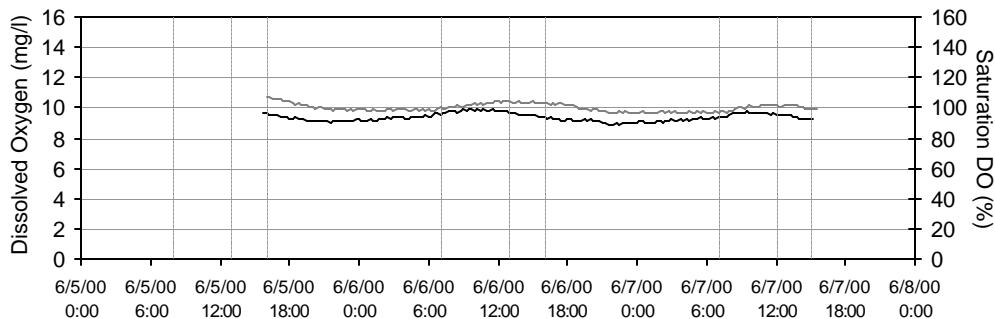


(d)

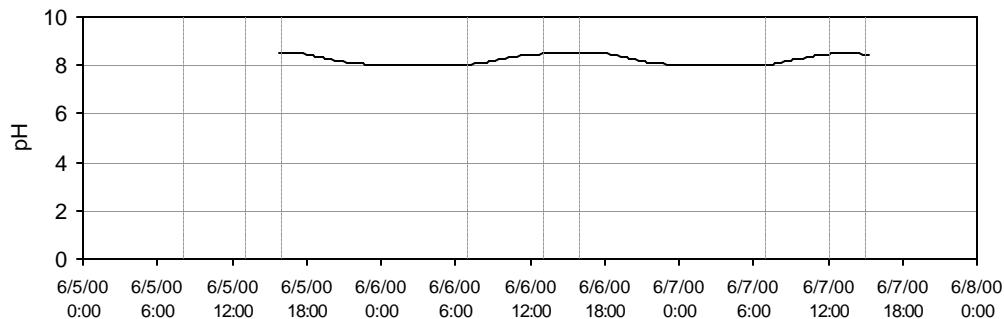
Figure I-5 Scott River at Ft. Jones, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



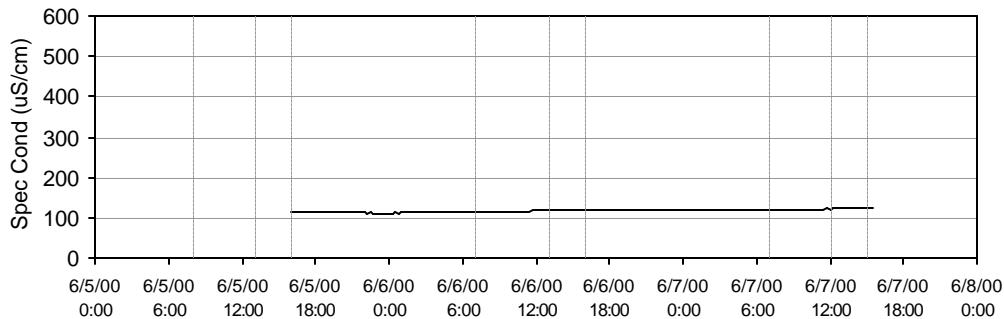
(a)



(b)

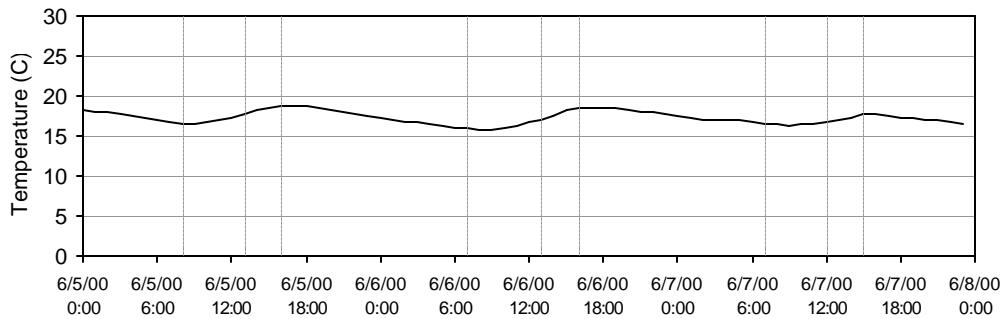


(c)

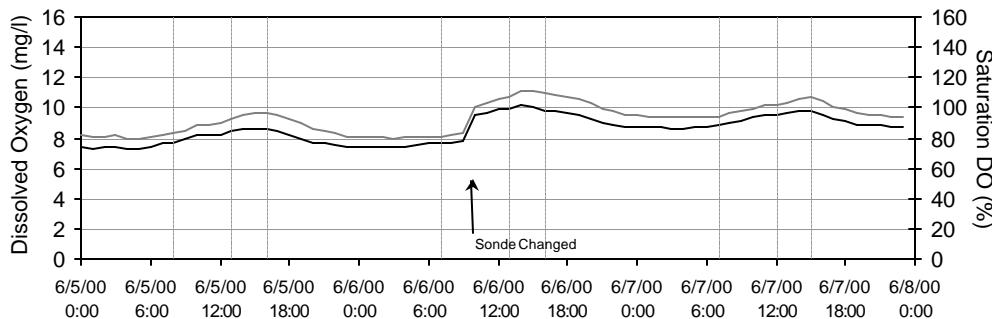


(d)

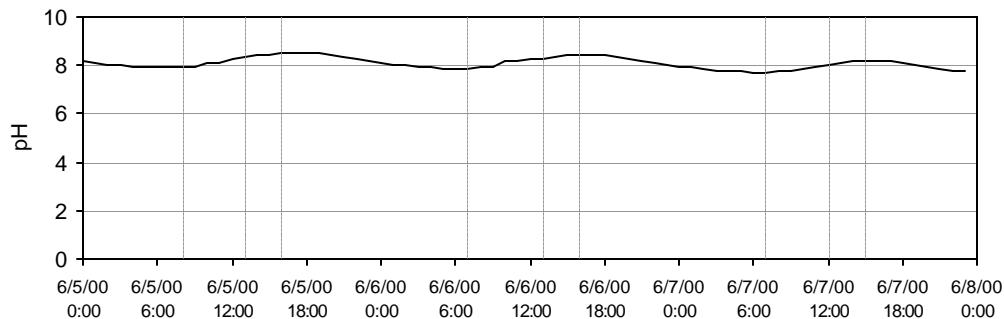
Figure I-6 Scott River at mouth, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



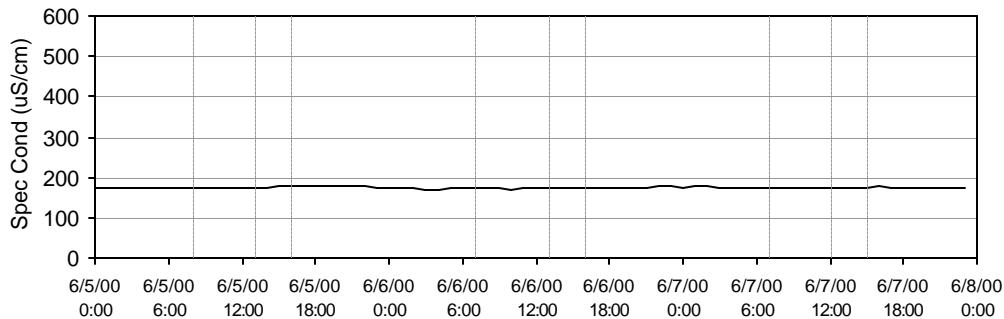
(a)



(b)



(c)



(d)

Figure I-7 Klamath River near Seiad Valley, June 5-7, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

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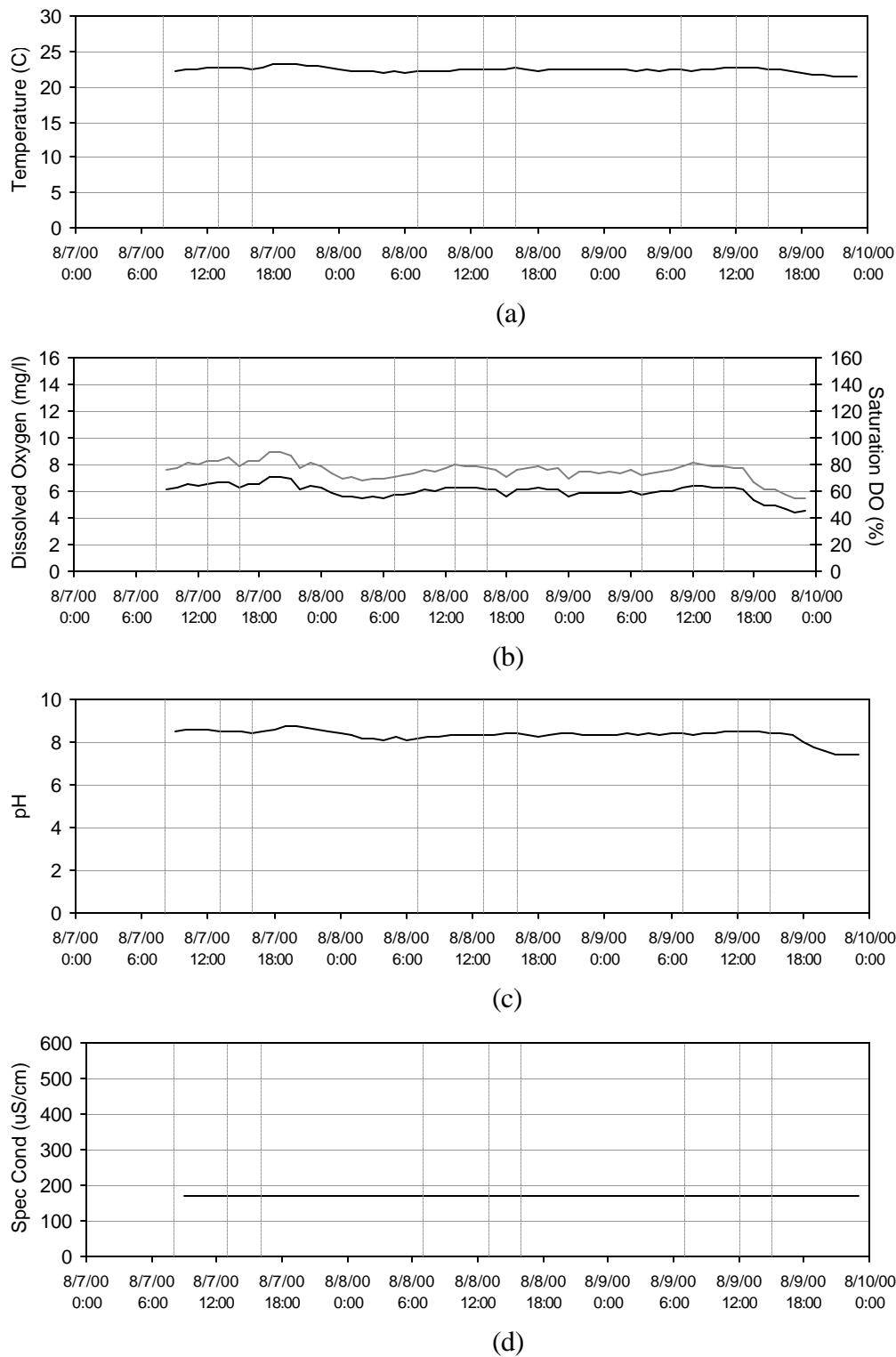
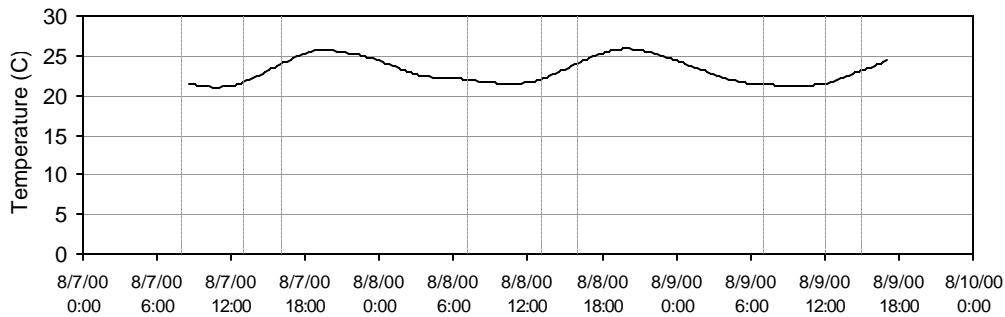
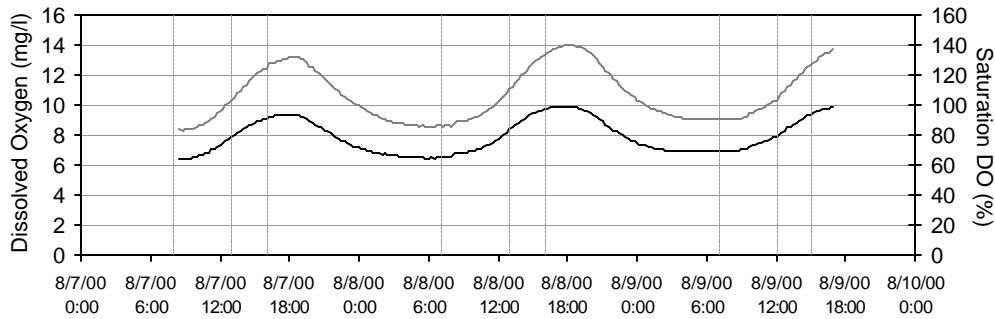


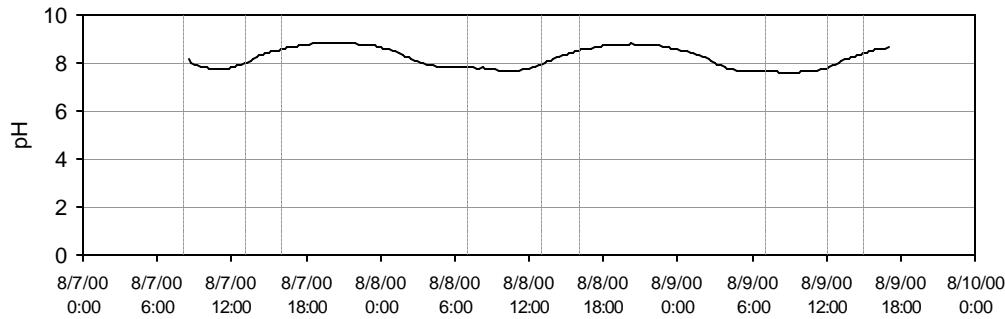
Figure I-8 Klamath River below Iron Gate Dam, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



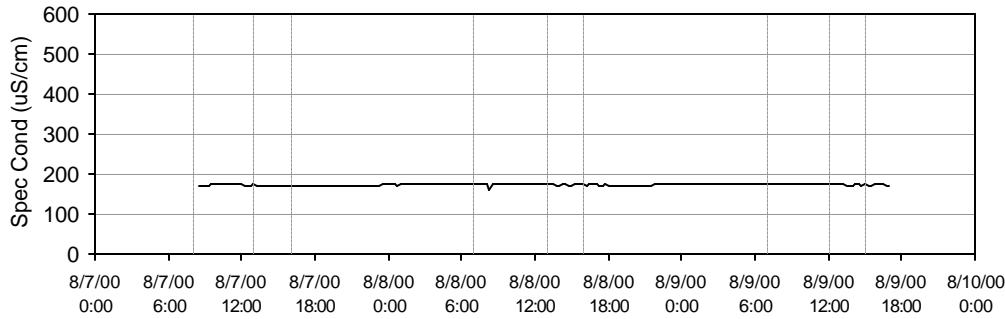
(a)



(b)



(c)



(d)

Figure I-9 Klamath River above Shasta River, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

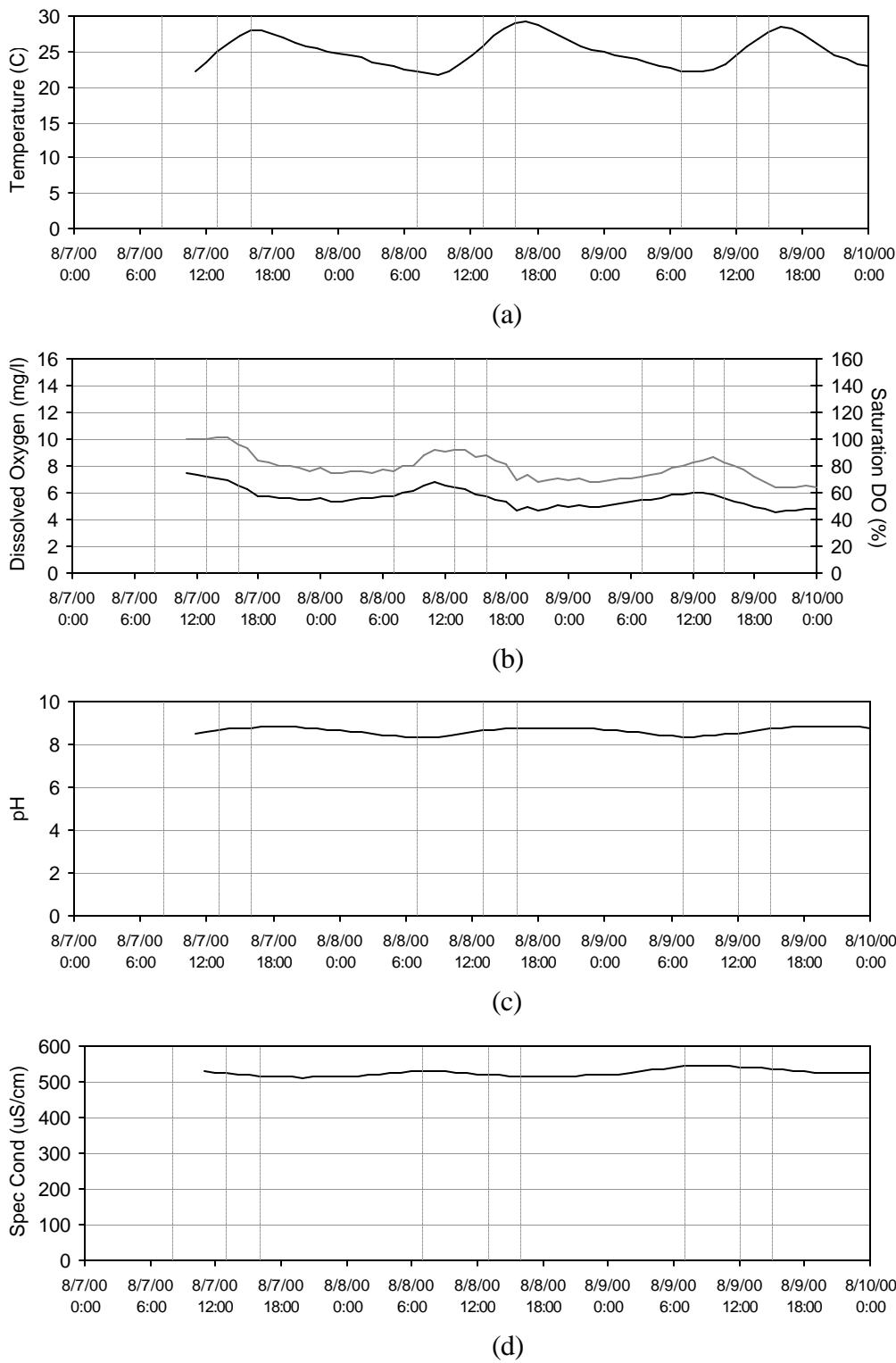


Figure I-10 Shasta River, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

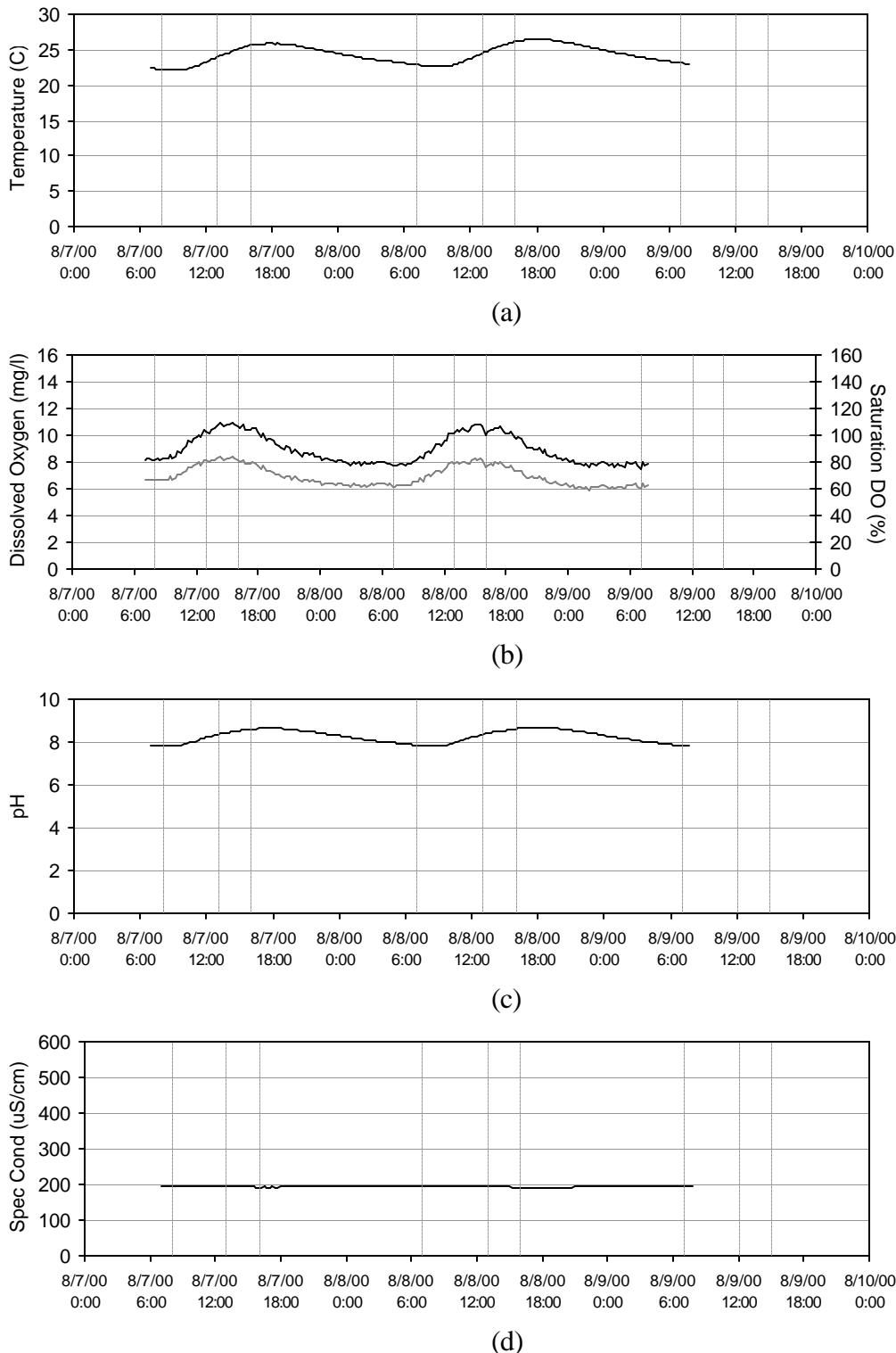
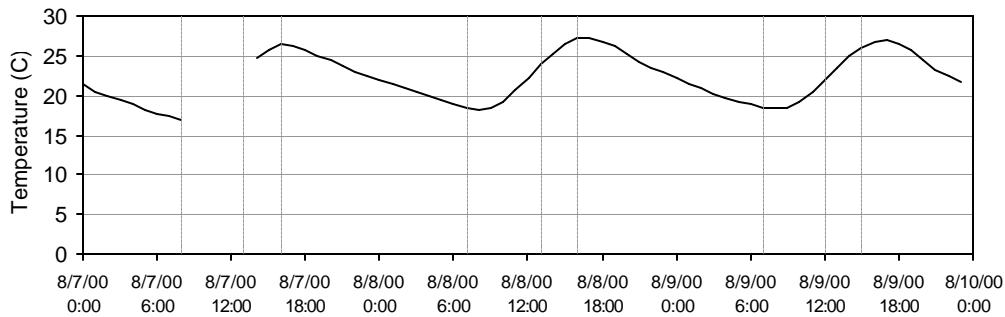
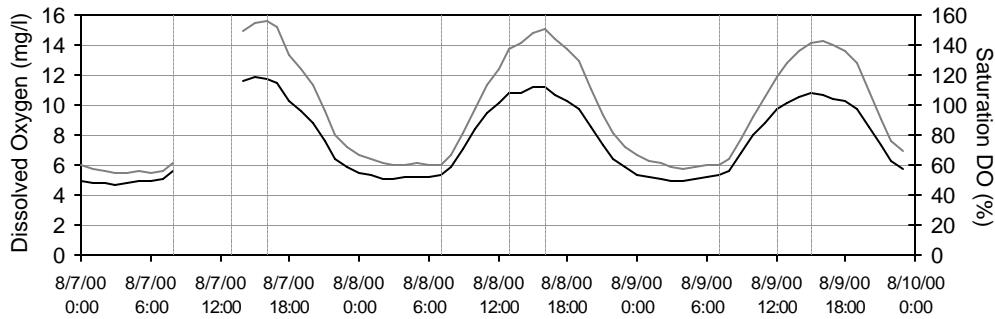


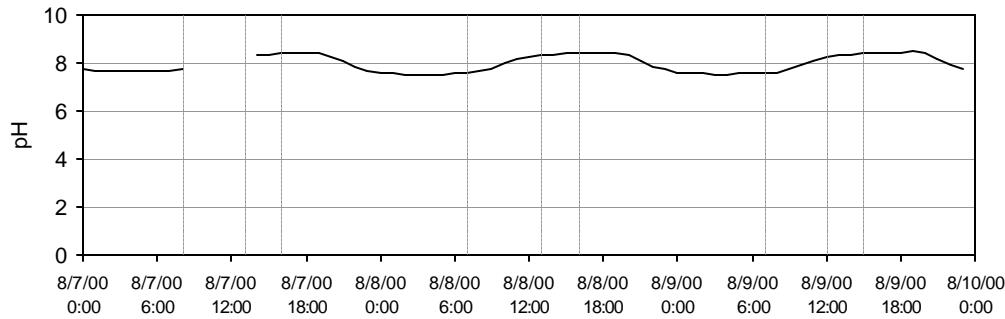
Figure I-11 Klamath River above Scott River, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



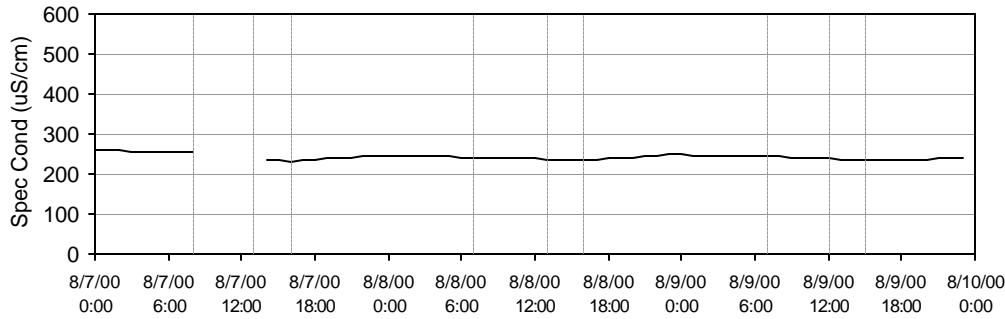
(a)



(b)



(c)



(d)

Figure I-12 Scott River at Ft. Jones, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

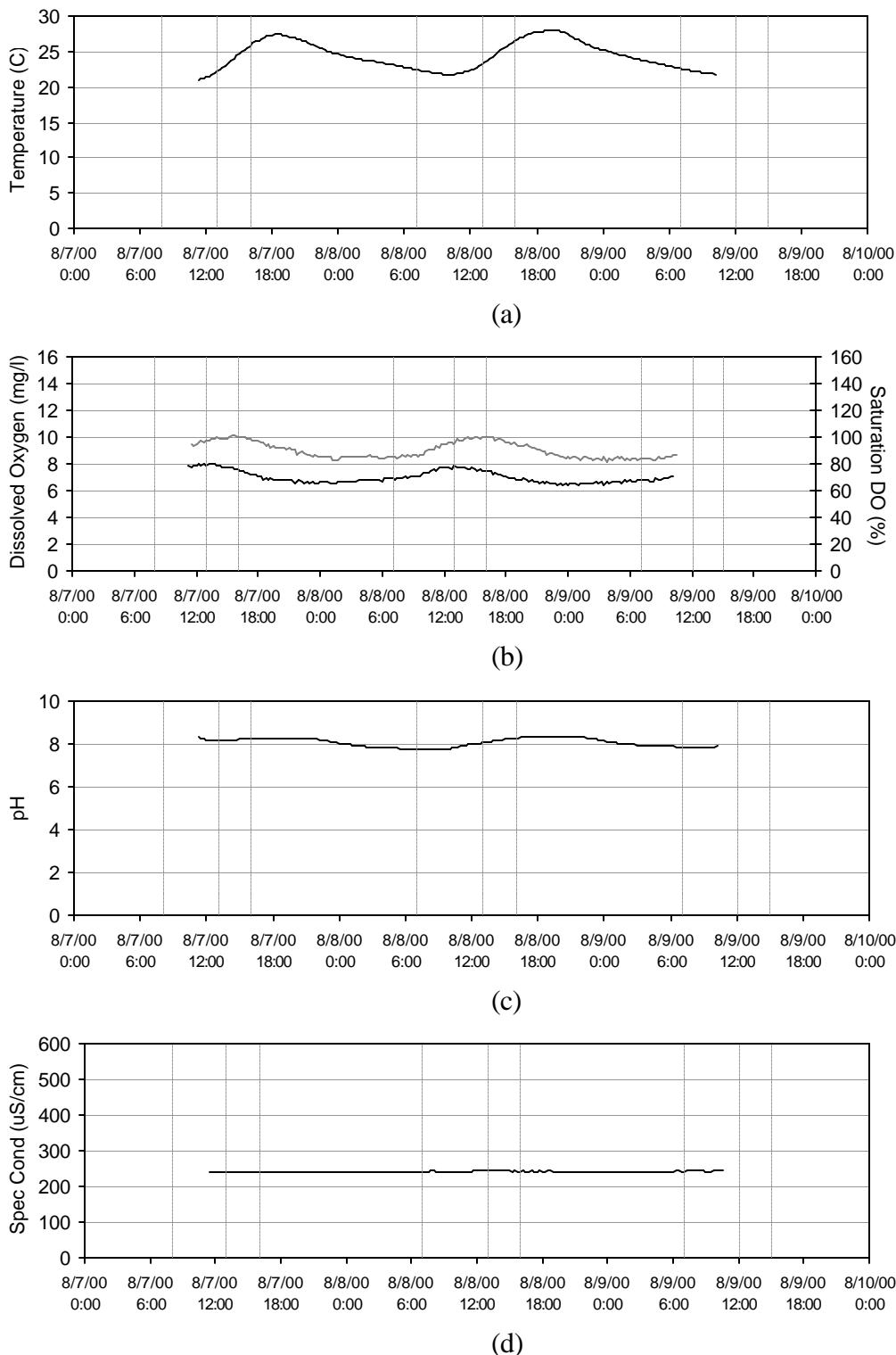
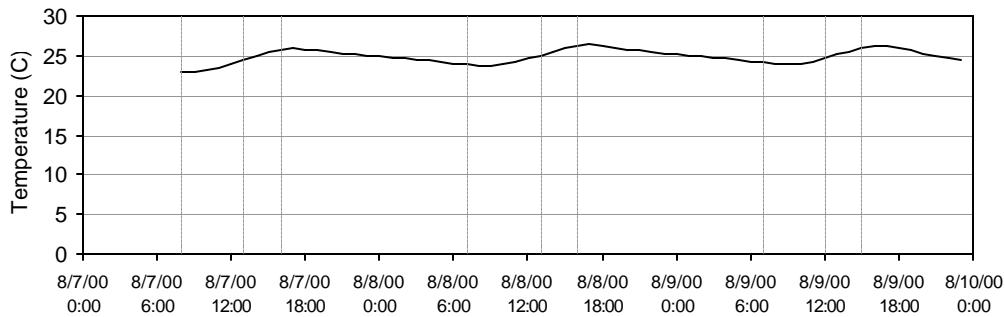
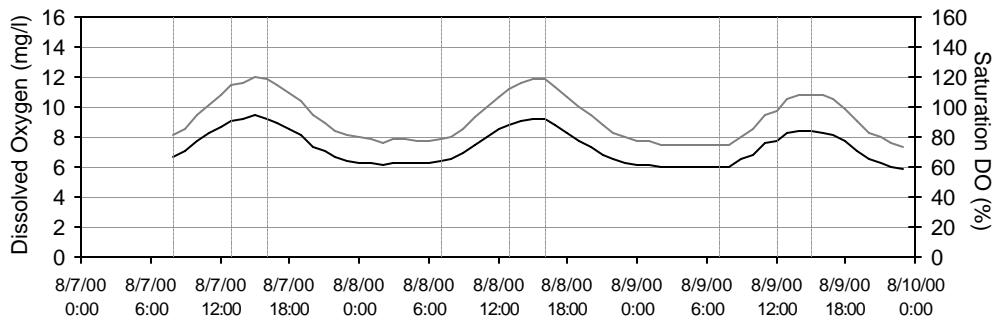


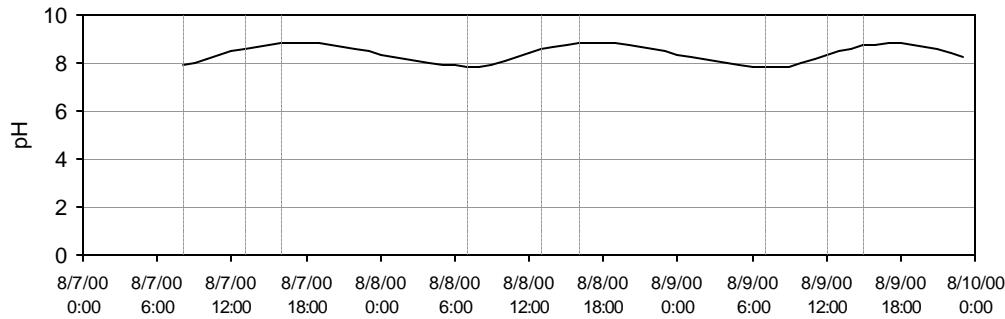
Figure I-13 Scott River at mouth, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance



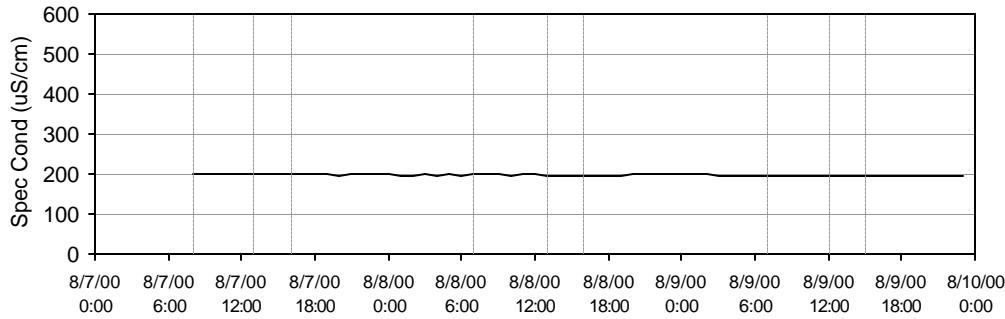
(a)



(b)



(c)



(d)

Figure I-14 Klamath River near Seiad Valley, August 7-9, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

Synoptic Survey September 26-29, 2000 (Sonde only)

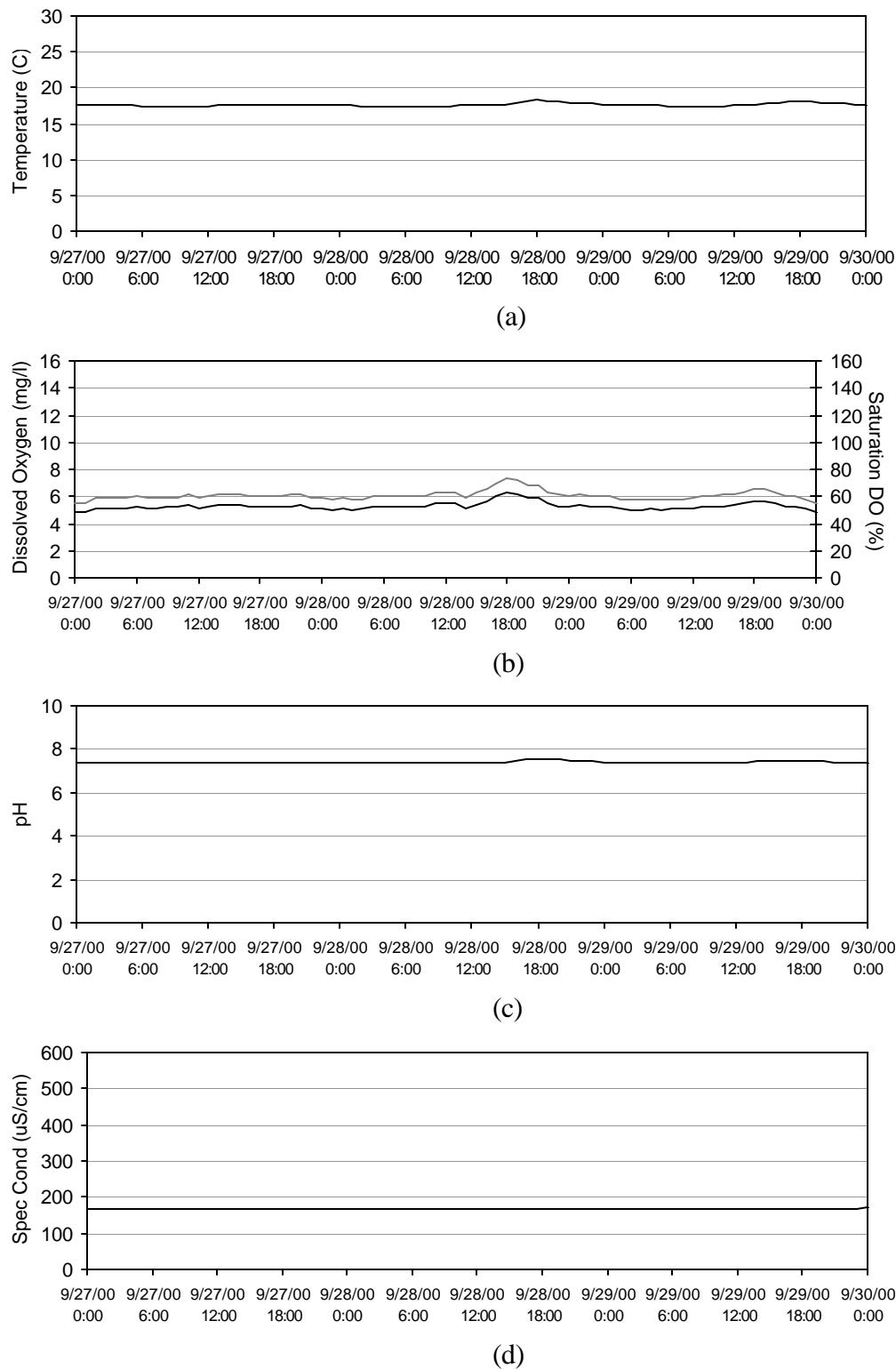


Figure I-15 Klamath River below Iron Gate Dam, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

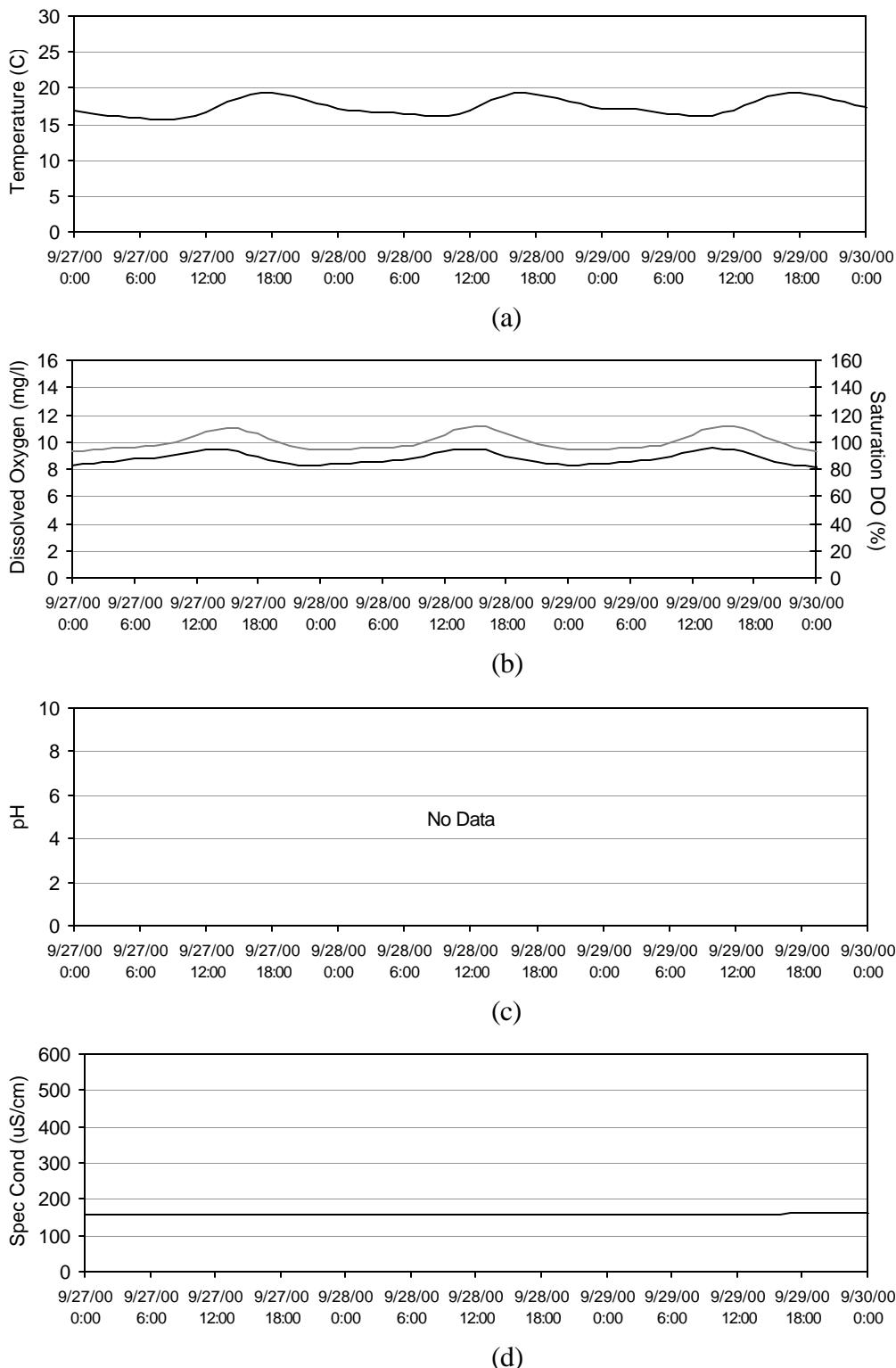


Figure I-16 Klamath River above Shasta River, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

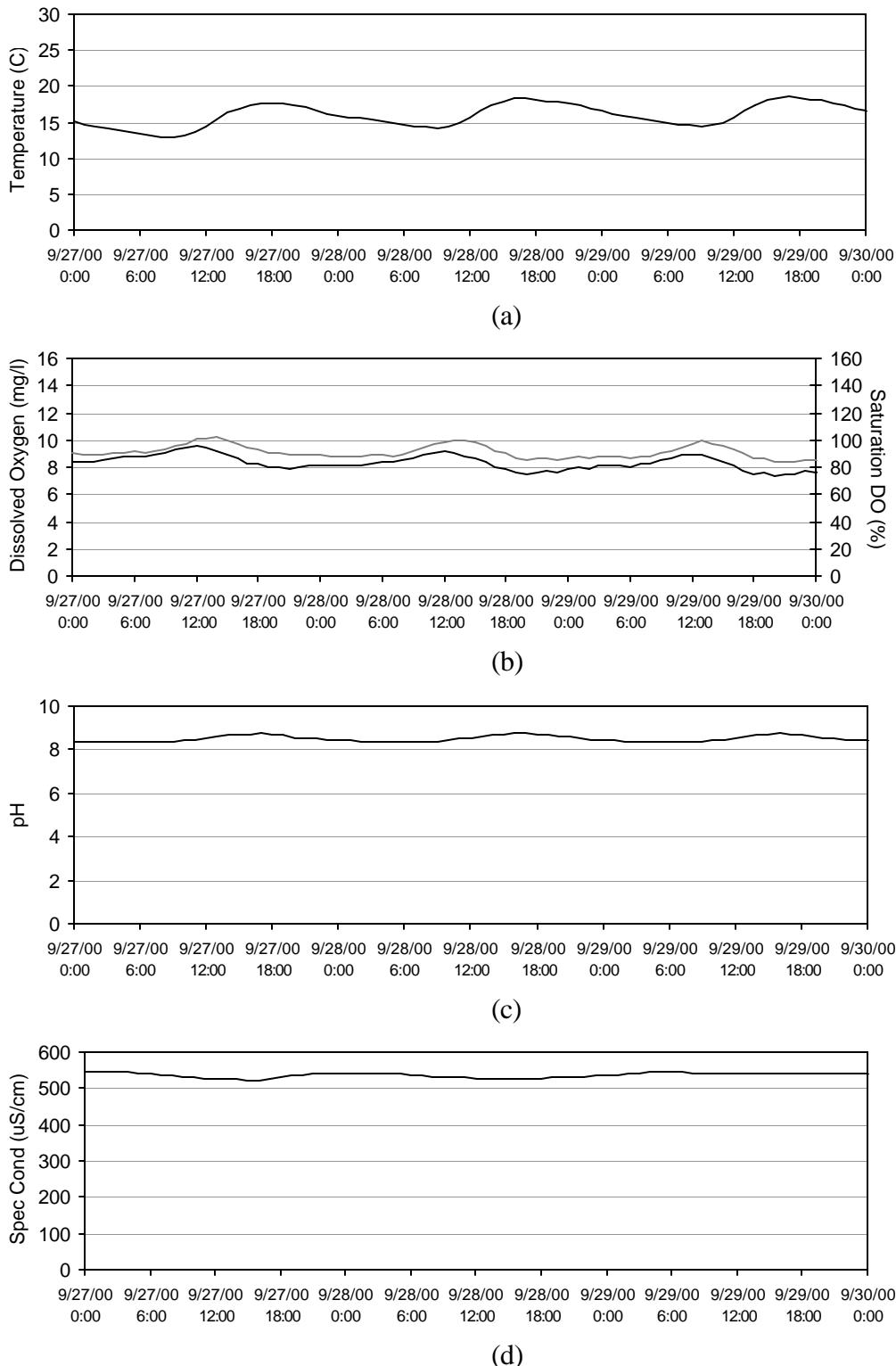


Figure I-17 Shasta River, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

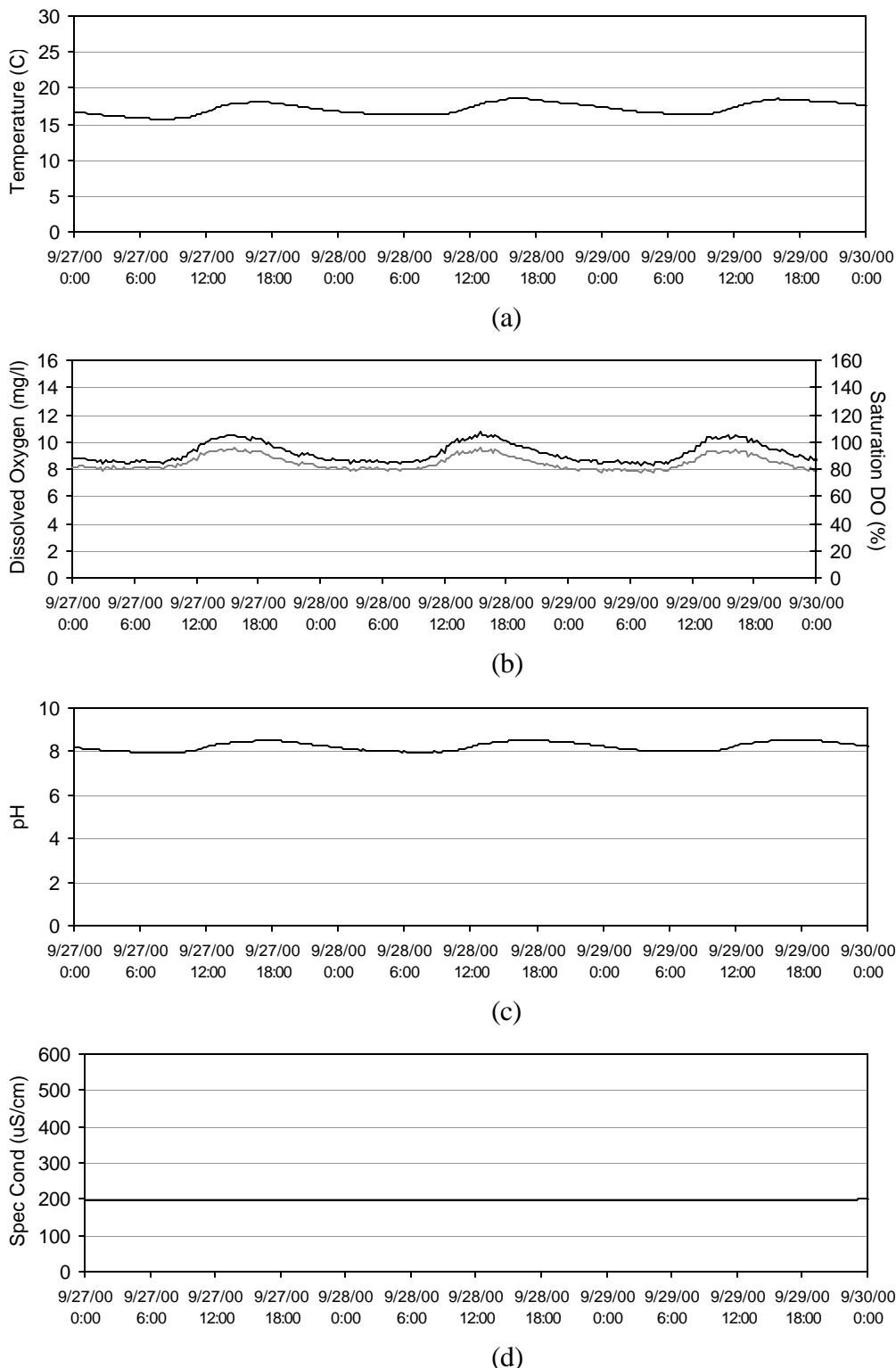


Figure I-18 Klamath River above Scott River, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

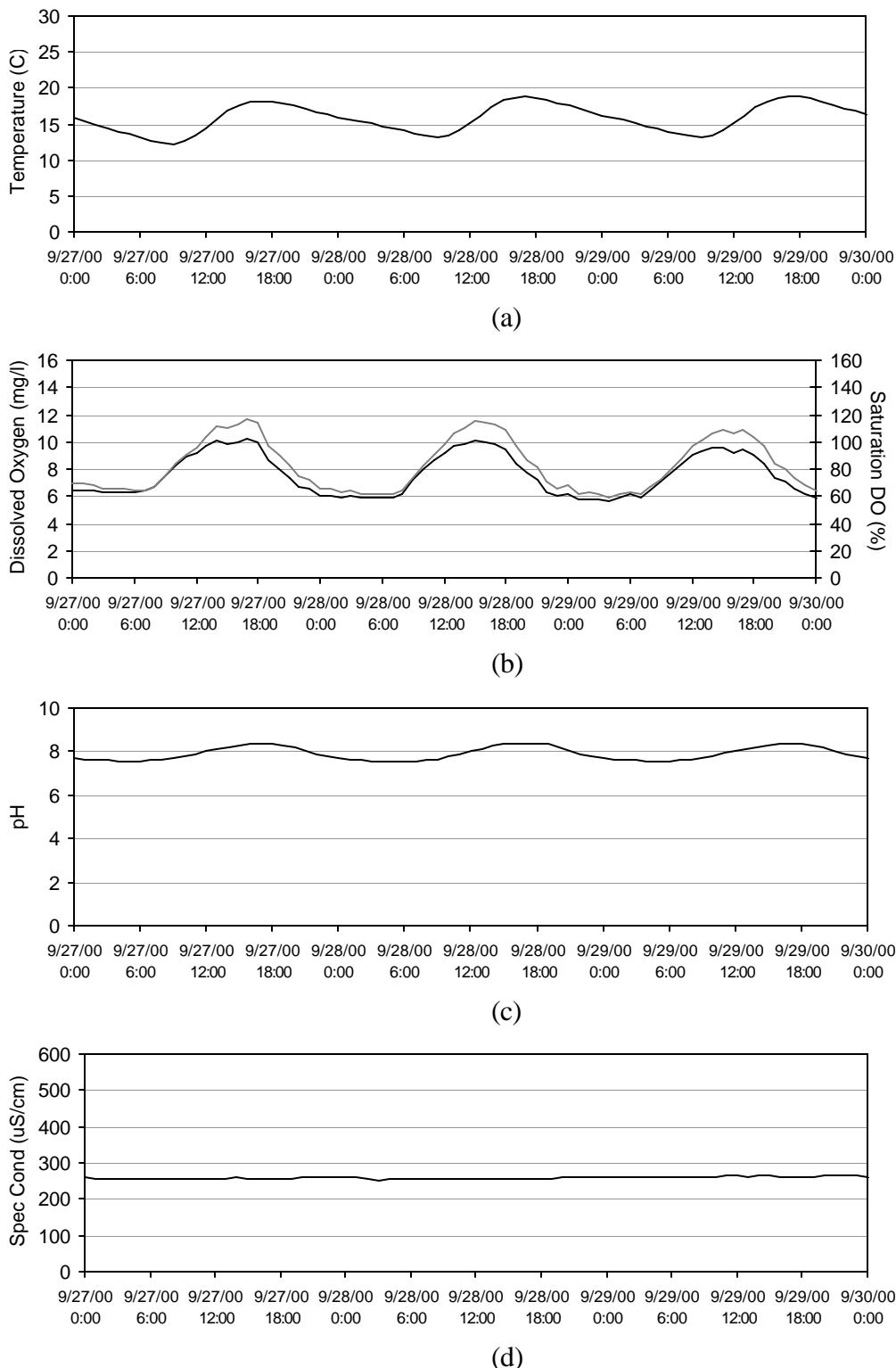


Figure I-19 Scott River at Ft. Jones, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

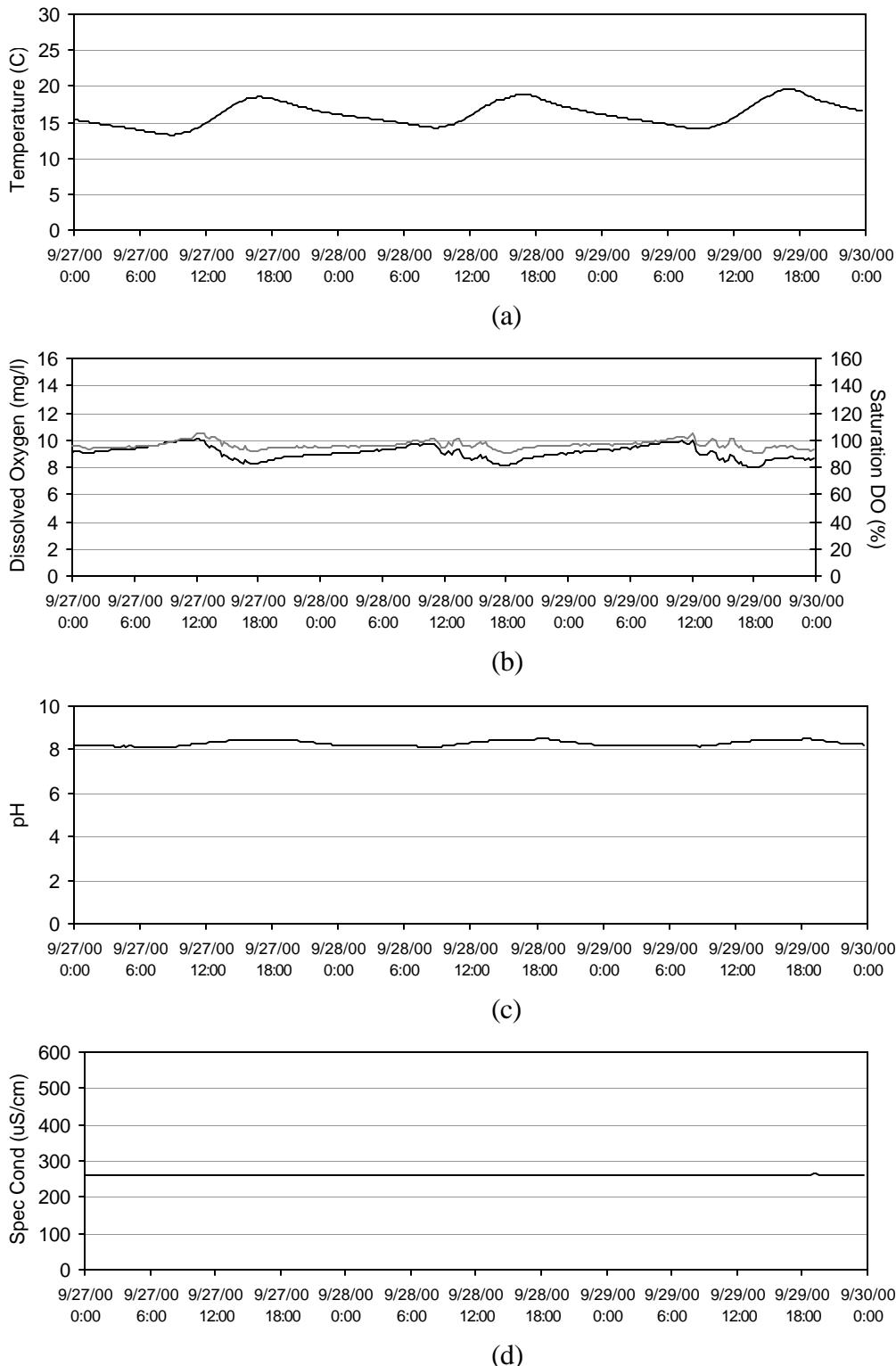


Figure I-20 Scott River at mouth, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

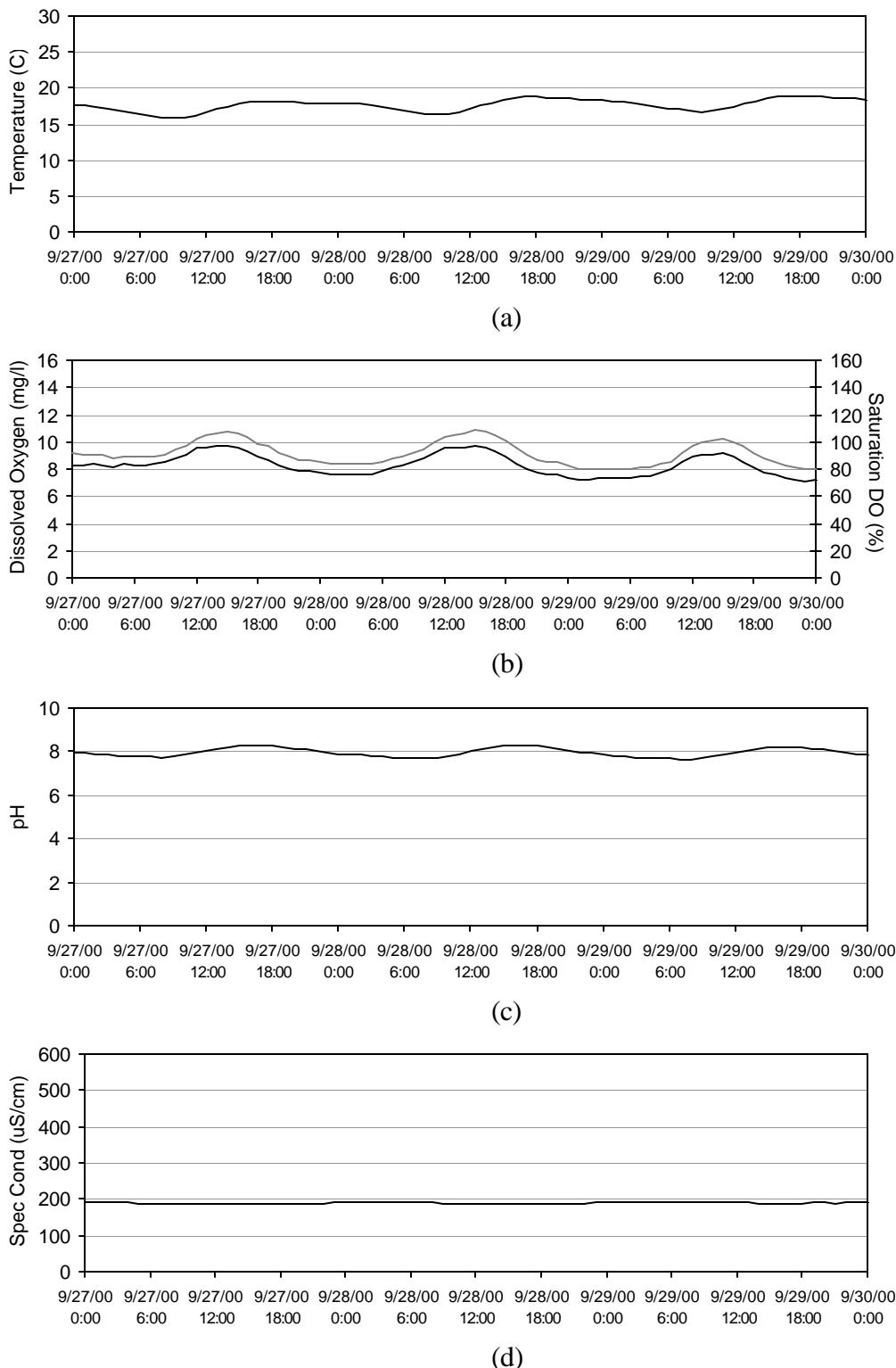


Figure I-21 Klamath River near Seiad Valley, September 27-29, 2000: (a) water temperature, (b) dissolved oxygen, (c) pH, and (d) specific conductance

J DATASONDE DATA

Datasonde data was collected at 13 locations outlined in Table J-1. It is apparent when reviewing the following graphs that water quality probe measurements suffer from biofouling and other probe related problems. The reader is referred to the discussion of water quality probe deployment in the main report. These are raw data sets that have not been processed beyond removing data that was sampled when the probes were not in the water.

Table J-1 Water quality probe deployment locations

Sampling Location	Latitude	Longitude
Klamath River at Miller Island	N42° 8.821'	W121° 50.904'
KSD @ Hwy 97	N42° 4.846'	W121° 50.833'
KSD @ Stateline Rd.	N41° 59.804'	W121° 46.676'
KSD @ Tule Lake Outlet Tunnel	N41° 55.795'	W121° 36.022'
Keno Bridge	N42° 7.627'	W121° 55.700'
Klamath River above Copco	N41° 57.910'	W122° 15.390'
Klamath River bel. Iron Gate Dam	N41° 55.894'	W122° 26.394'
Shasta River @ USGS Gage	N41° 49.393'	W122° 35.708'
Scott River @ USGS Gage	N41° 38.429'	W123° 0.867'
Klamath R. at Seiad Valley @ USGS Gage	N41° 50.247'	W123° 11.855'
Salmon River	N41° 22.615'	W123° 28.632'
Trinity River	N41° 3.023'	W123° 40.397'
Klamath River at Youngs Bar	N41° 14.797'	W123° 46.398'

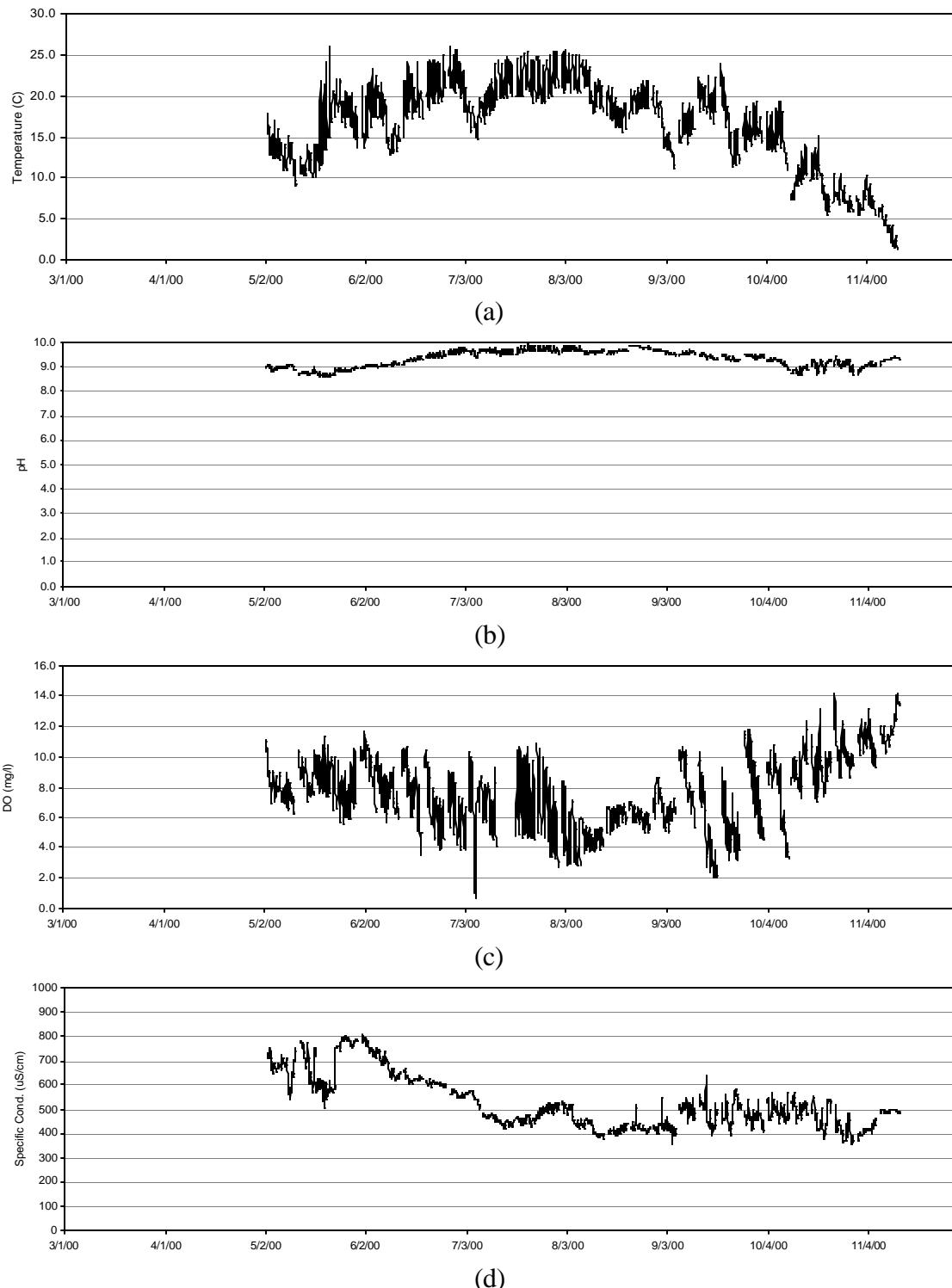
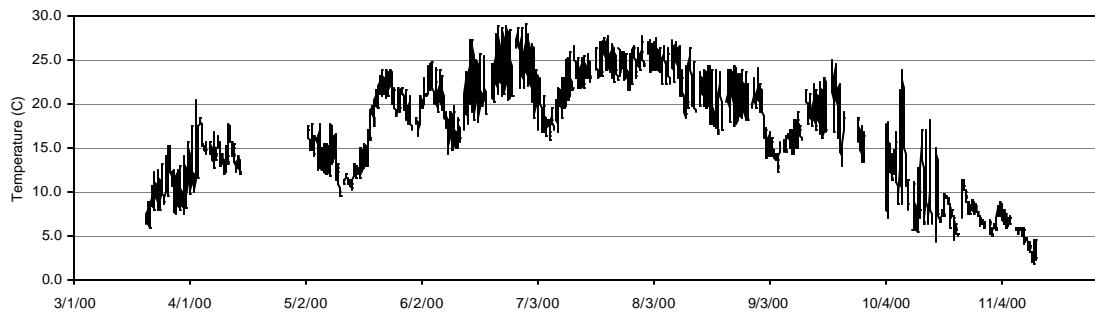
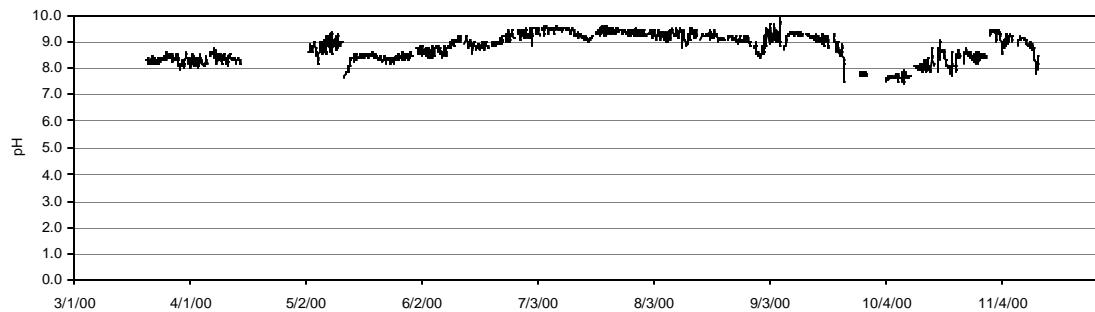


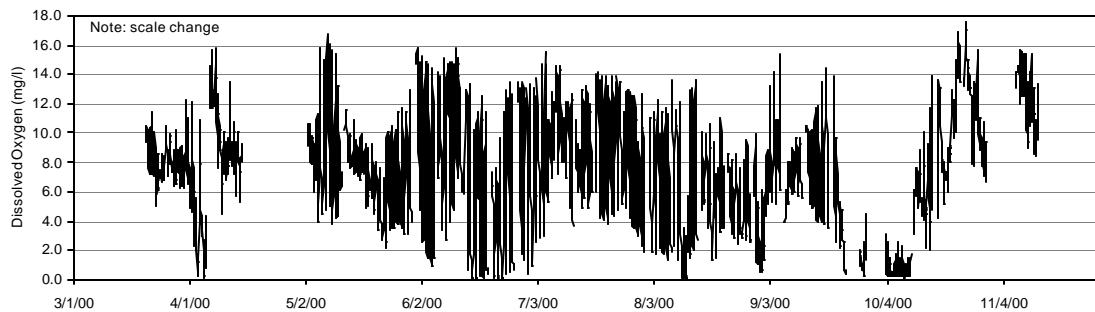
Figure J-1 Klamath Straight Drain at P-Canal (Tule Lake Outlet) hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



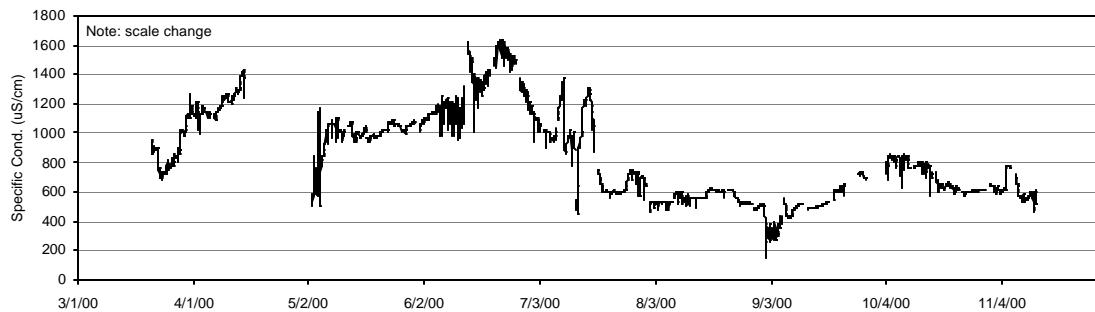
(a)



(b)

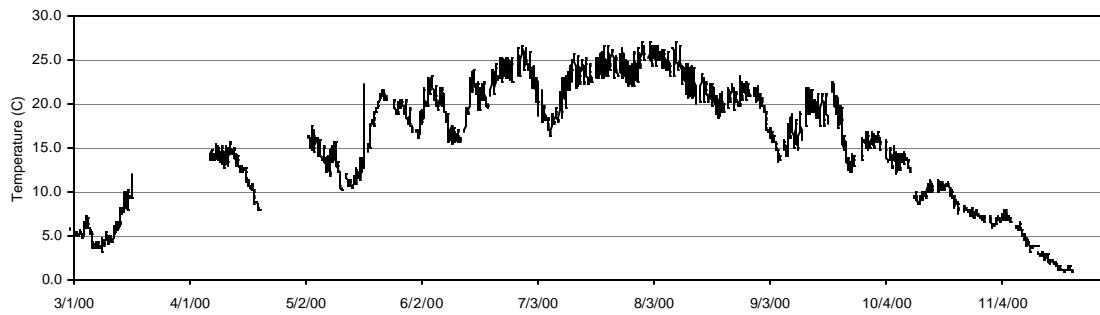


(c)

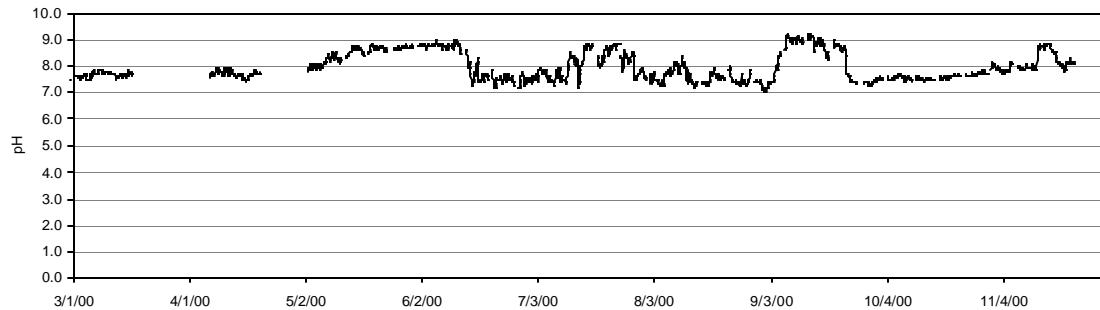


(d)

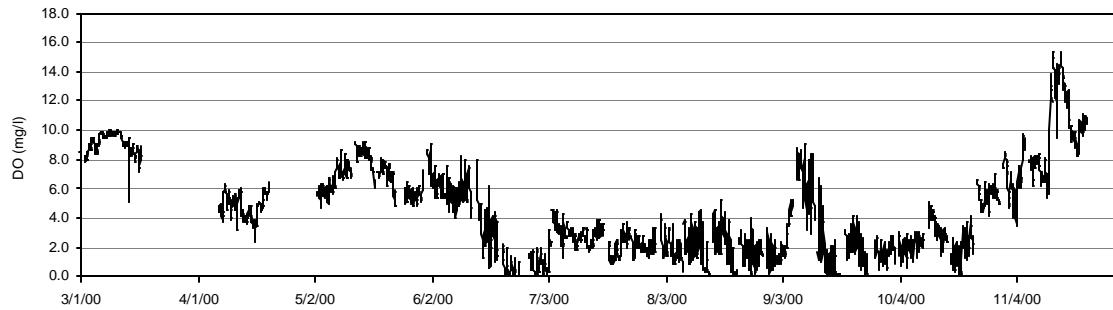
Figure J-2 Klamath Straight Drain at Stateline hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



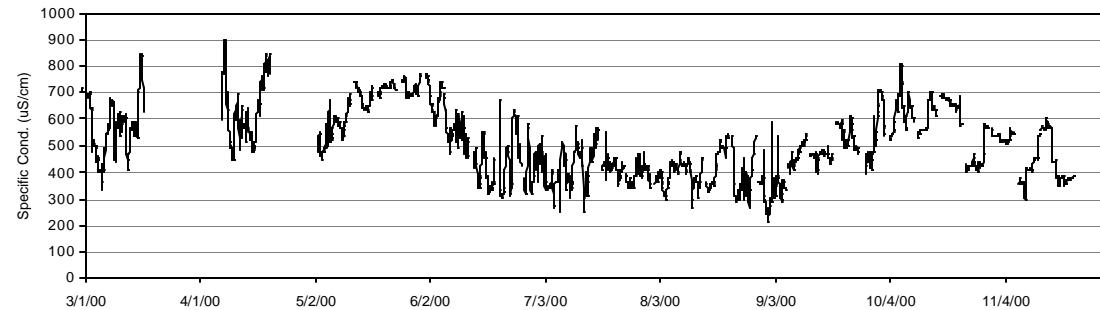
(a)



(b)



(c)



(d)

Figure J-3 Klamath Straight Drain at Highway 97 hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

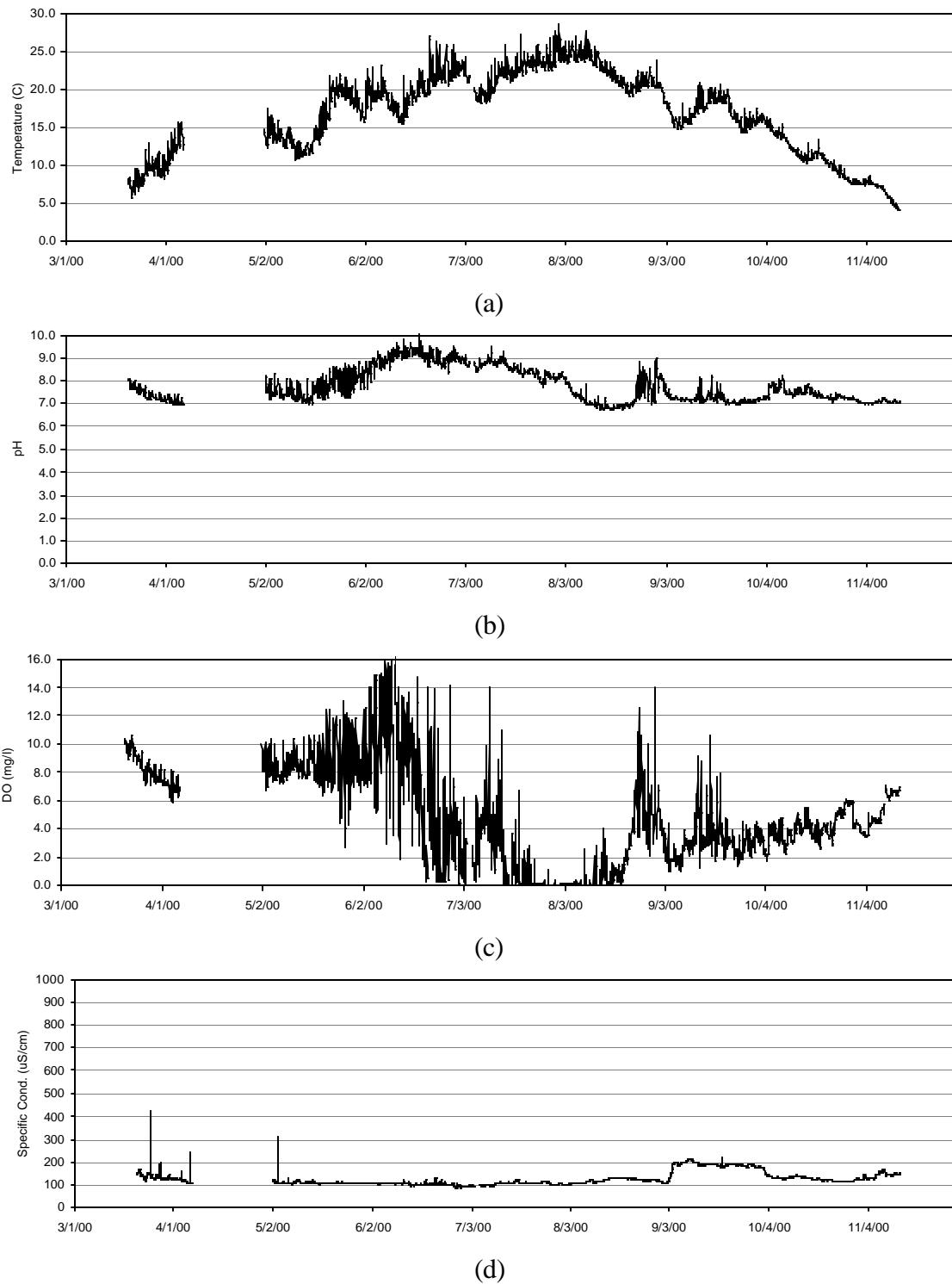


Figure J-4 Klamath River at Miller Island hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

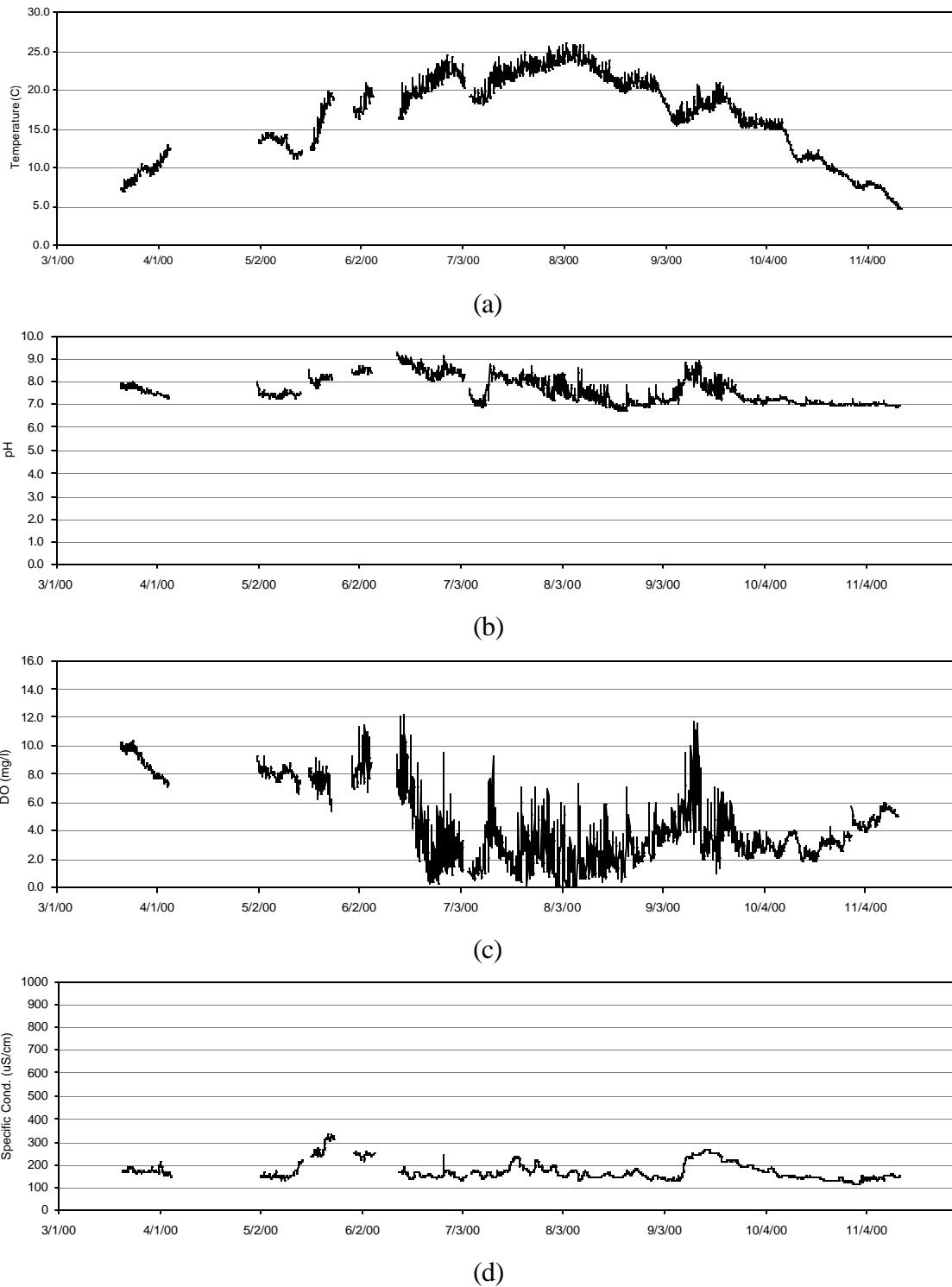
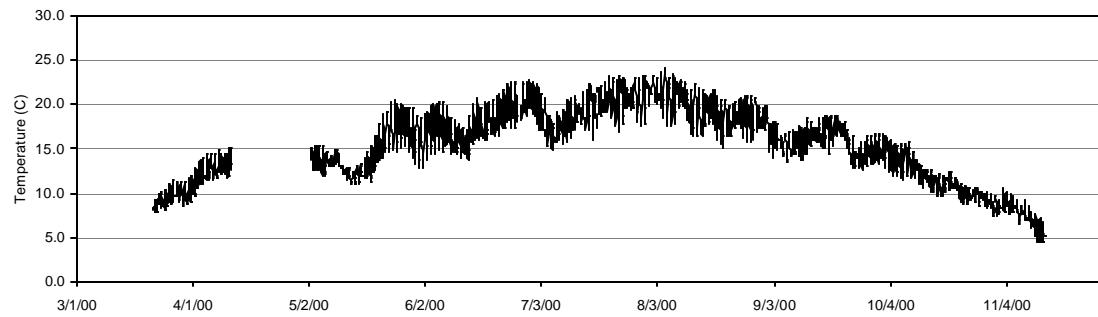
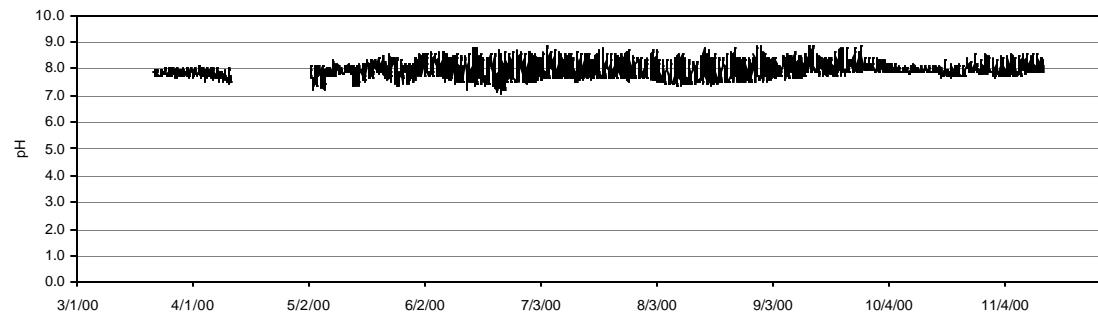


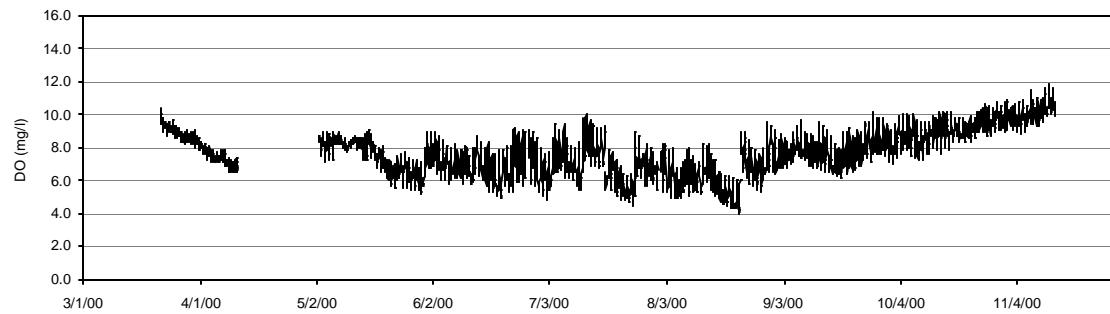
Figure J-5 Klamath River at Keno hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



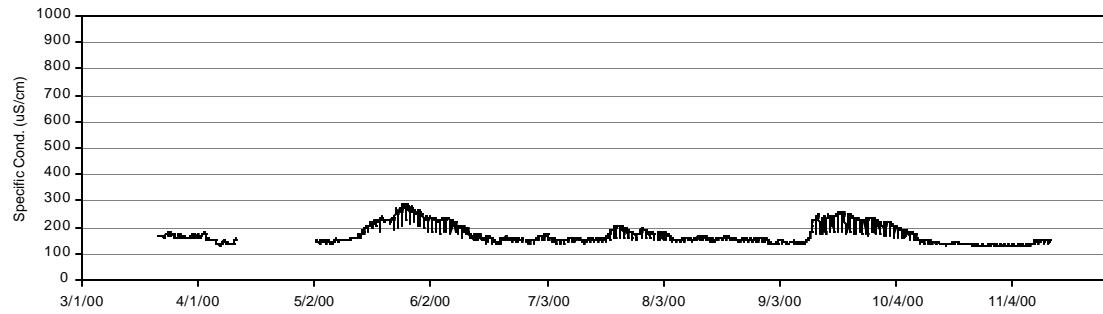
(a)



(b)



(c)



(d)

Figure J-6 Klamath River above Copco No. 1 Reservoir hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

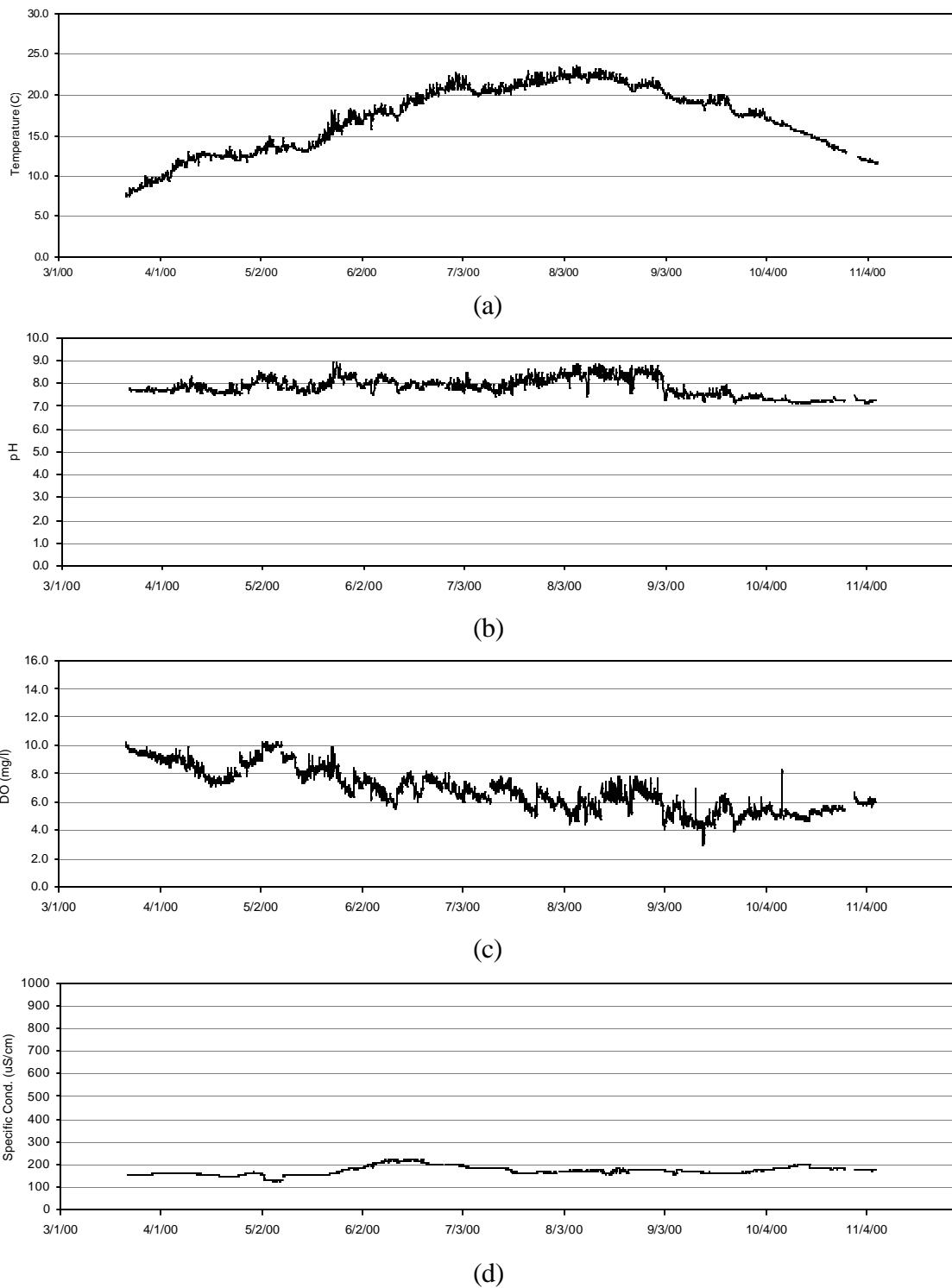
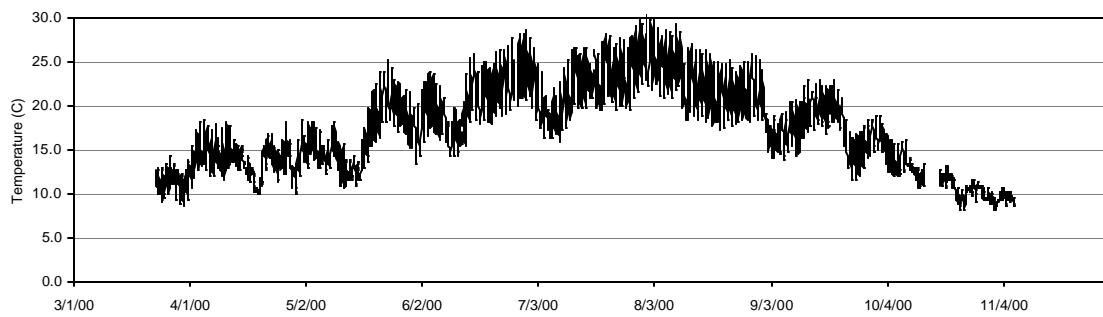
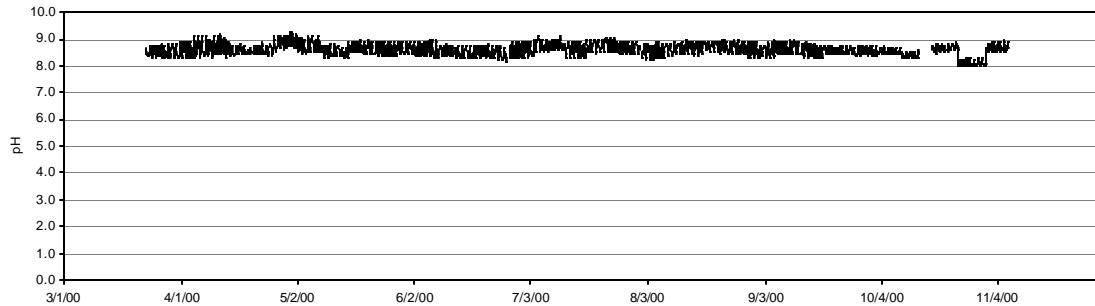


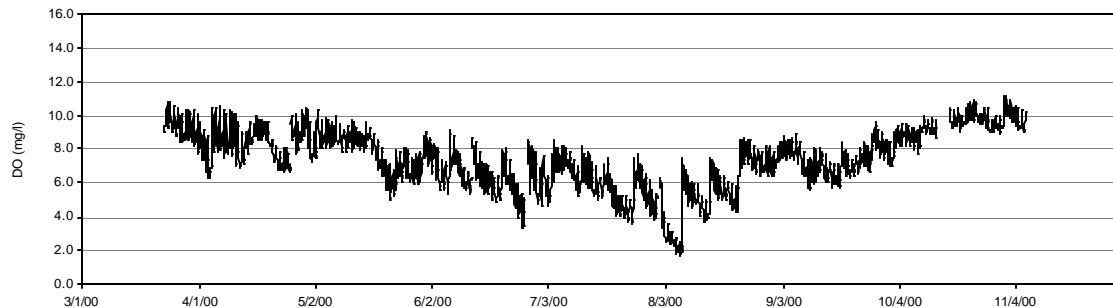
Figure J-7 Klamath River below Iron Gate Dam hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



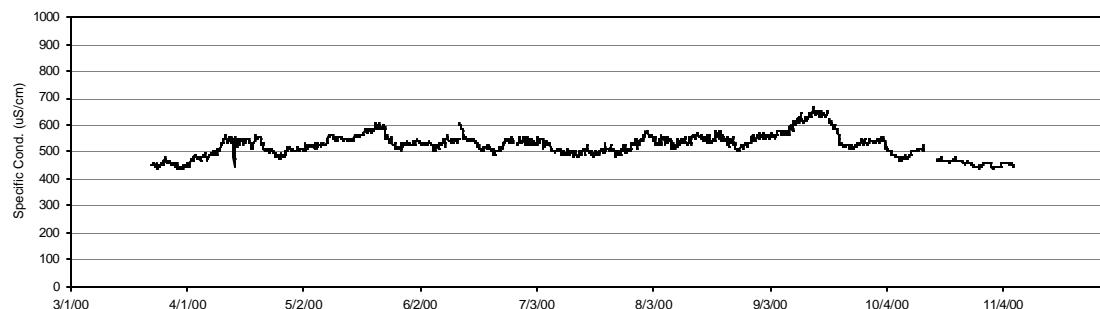
(a)



(b)



(c)



(d)

Figure J-8 Shasta River hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

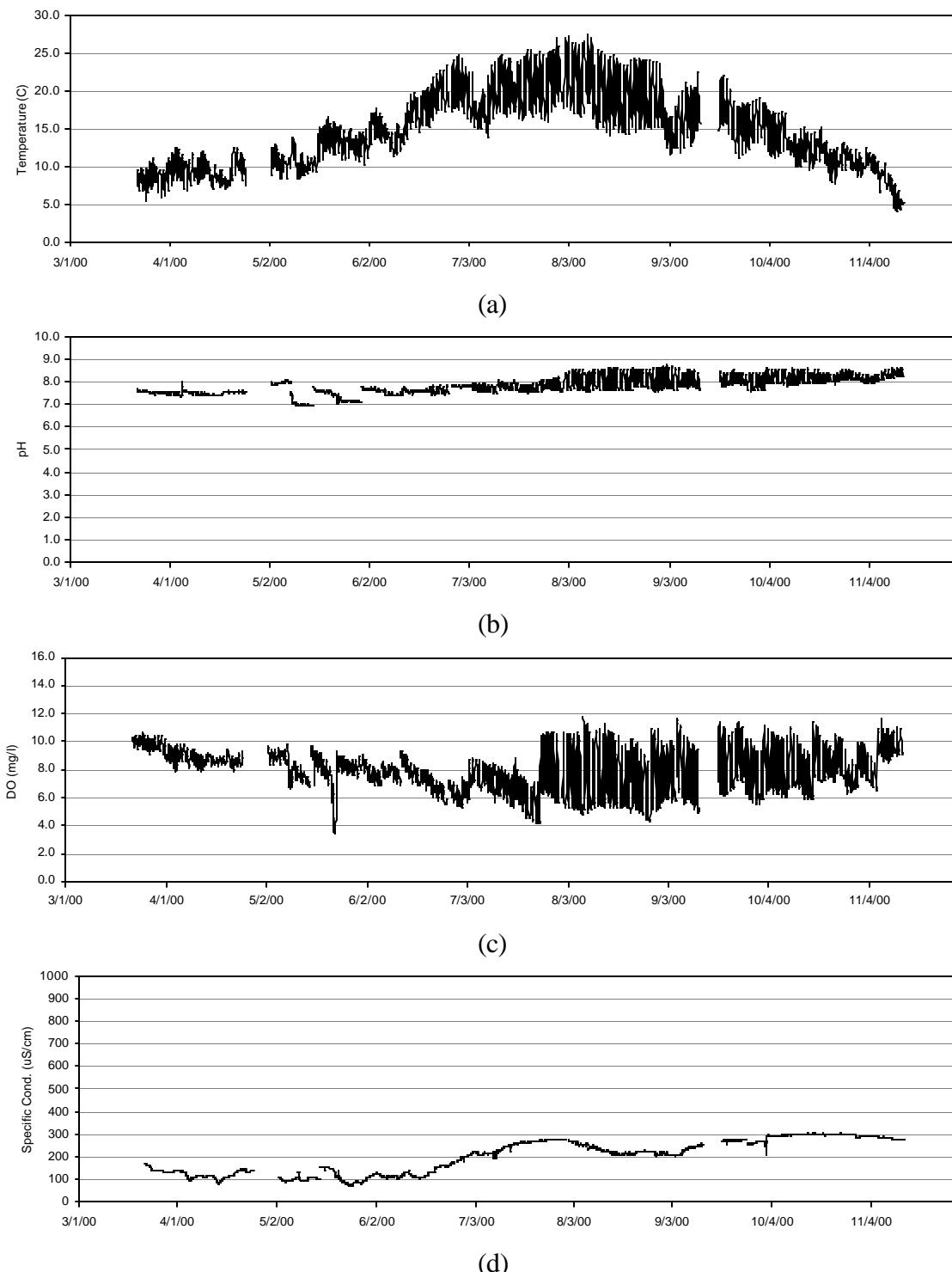
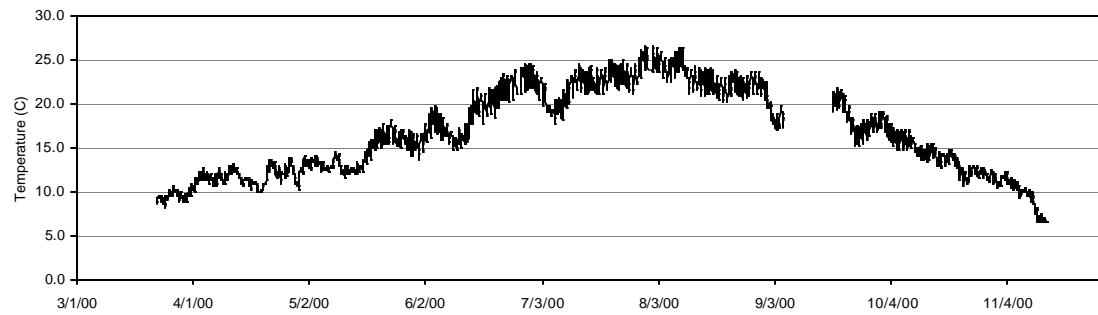
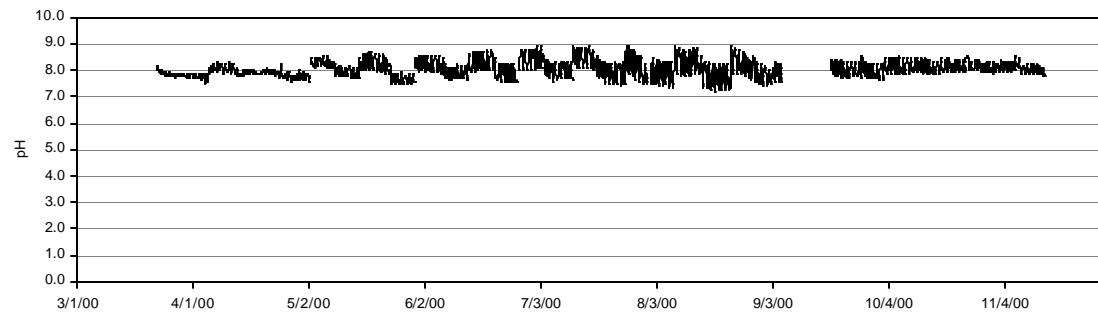


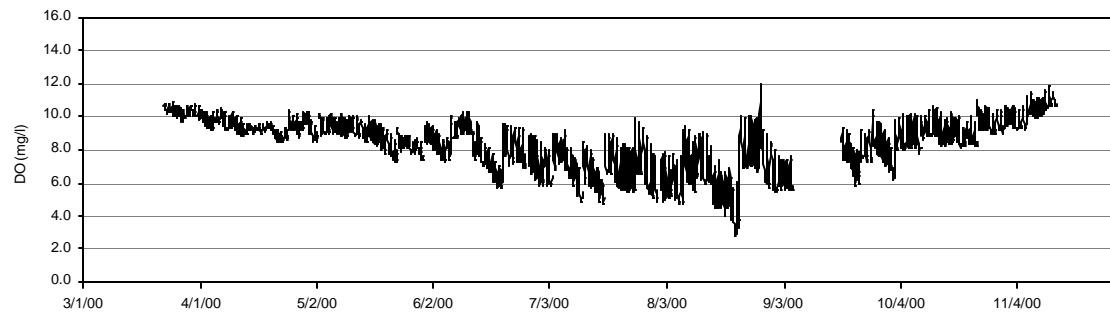
Figure J-9 Scott River near Ft. Jones hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



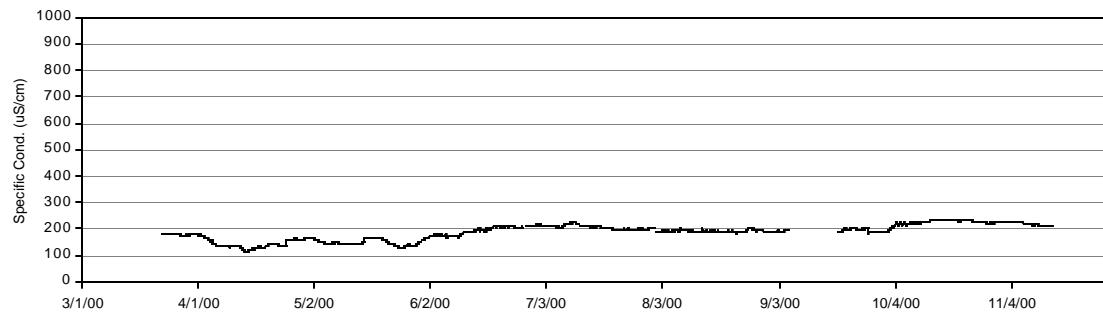
(a)



(b)



(c)



(d)

Figure J-10 Klamath River Near Seiad Valley hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

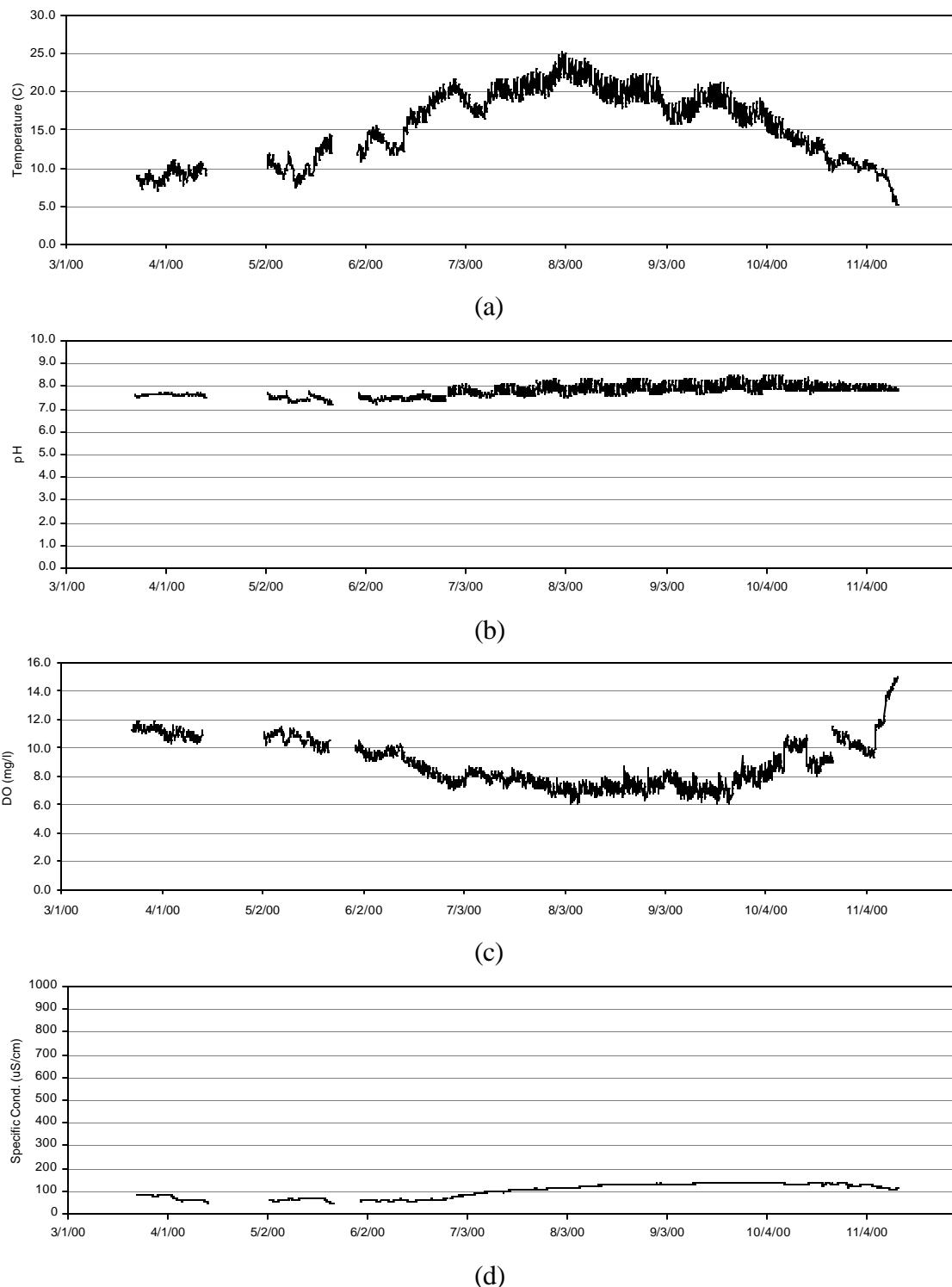


Figure J-11 Salmon River hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

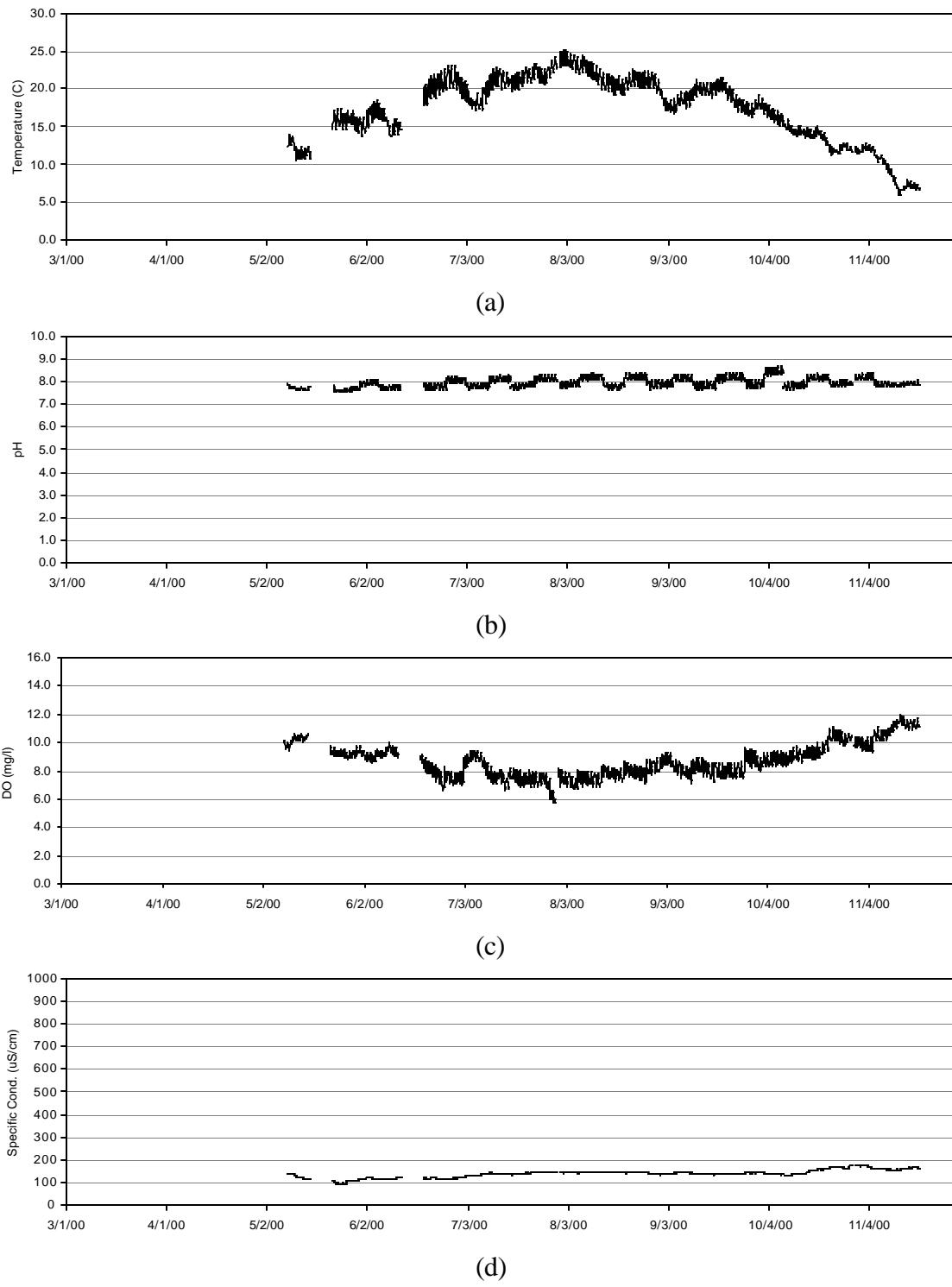
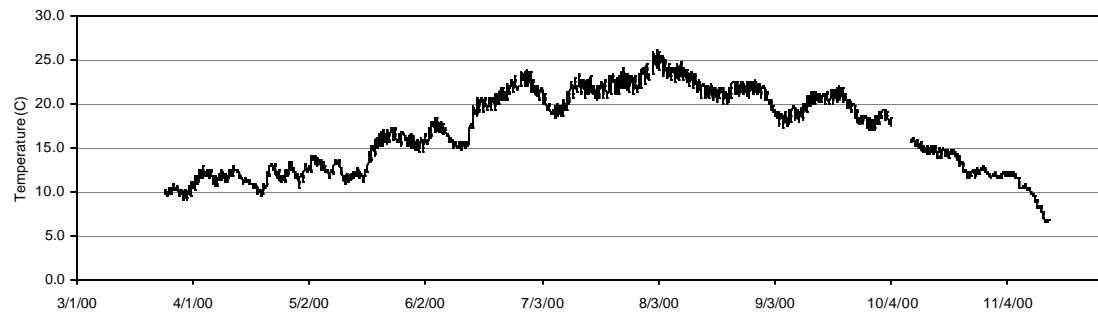
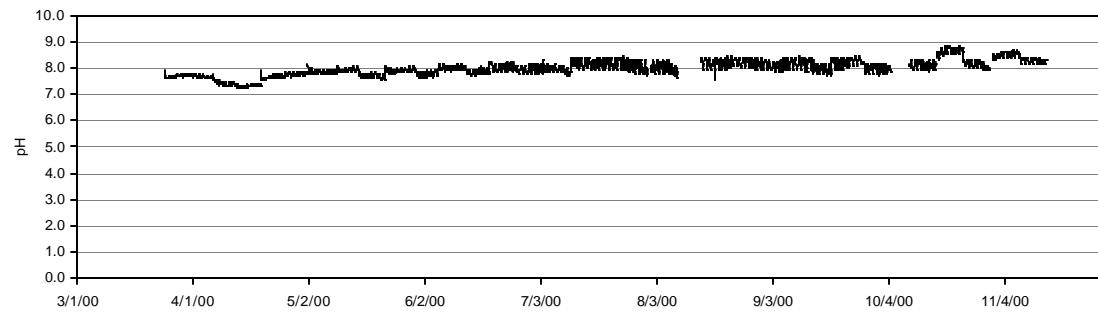


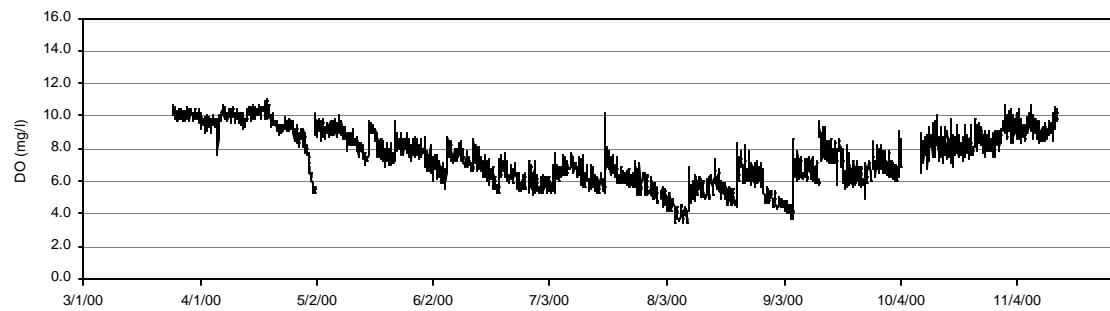
Figure J-12 Trinity River hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance



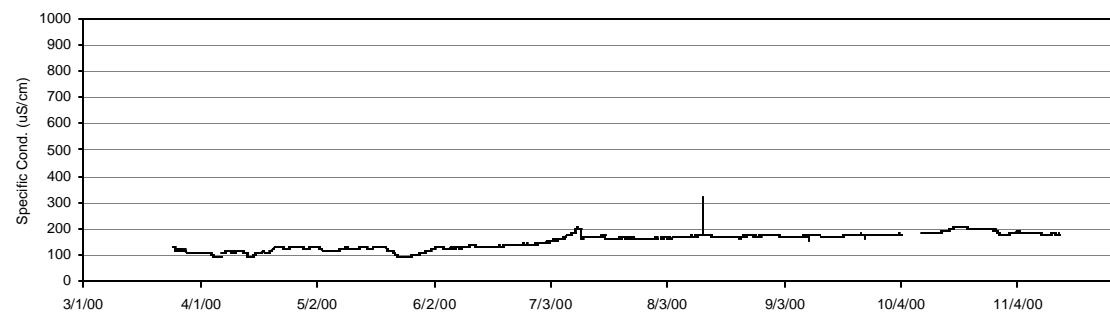
(a)



(b)



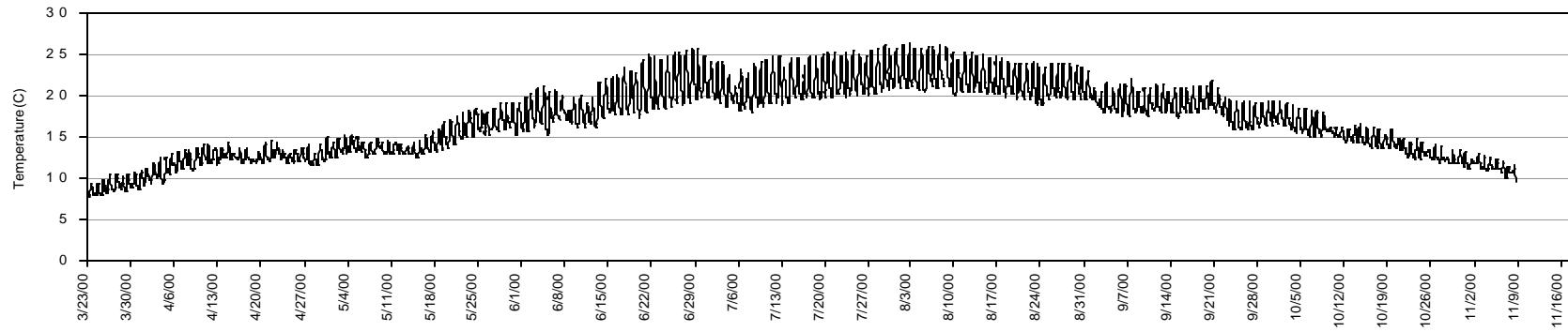
(c)



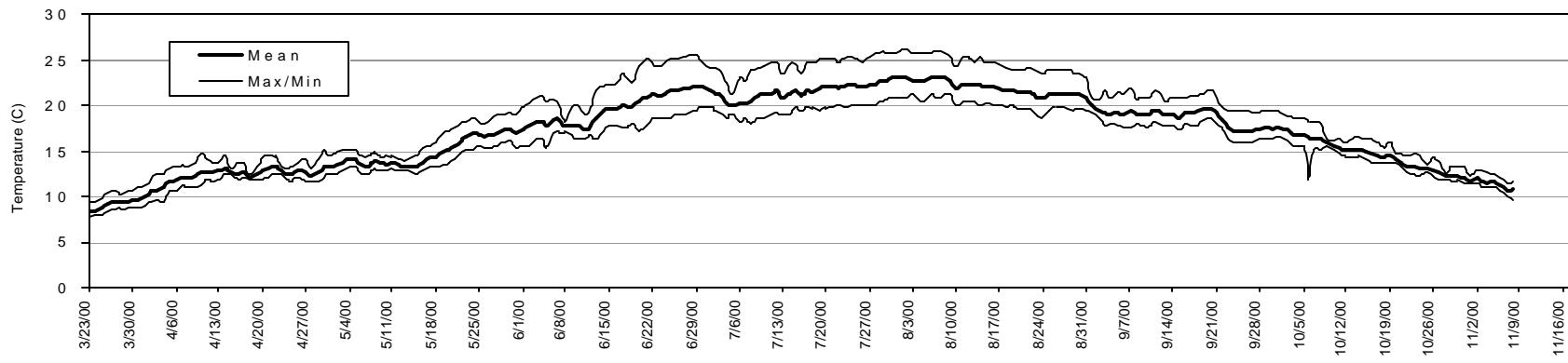
(d)

Figure J-13 Klamath River Near Youngs Bar hourly datasonde observations - 2000: (a) water temperature, (b) pH, (c) dissolved oxygen, and (d) specific conductance

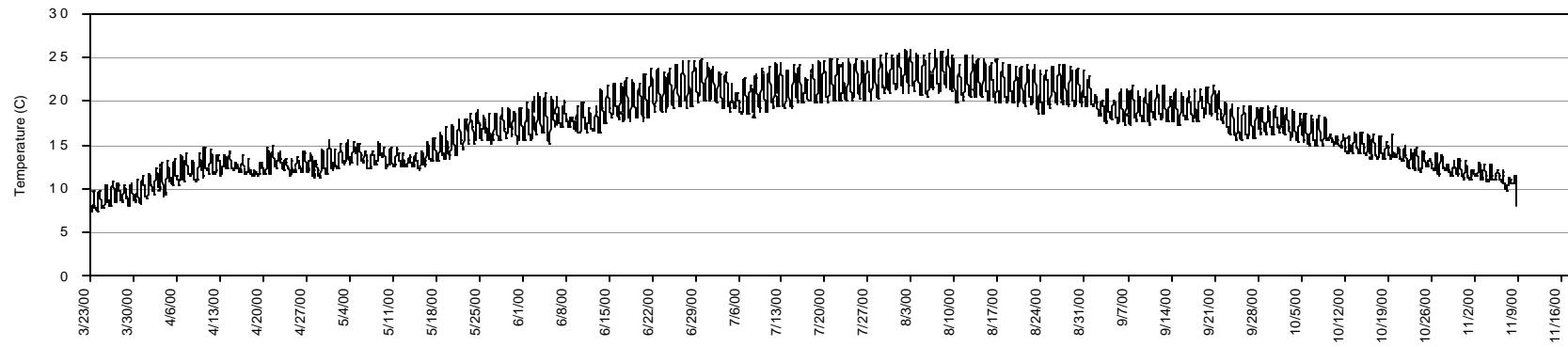
K WATER TEMPERATURE DATA



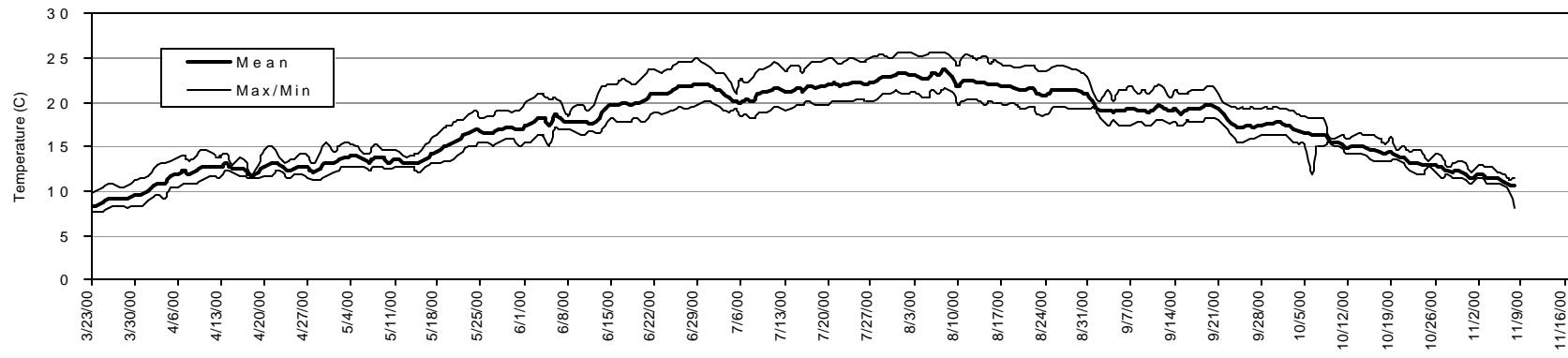
Klamath River observed hourly water temperature above Cottonwood Creek (RM 182)



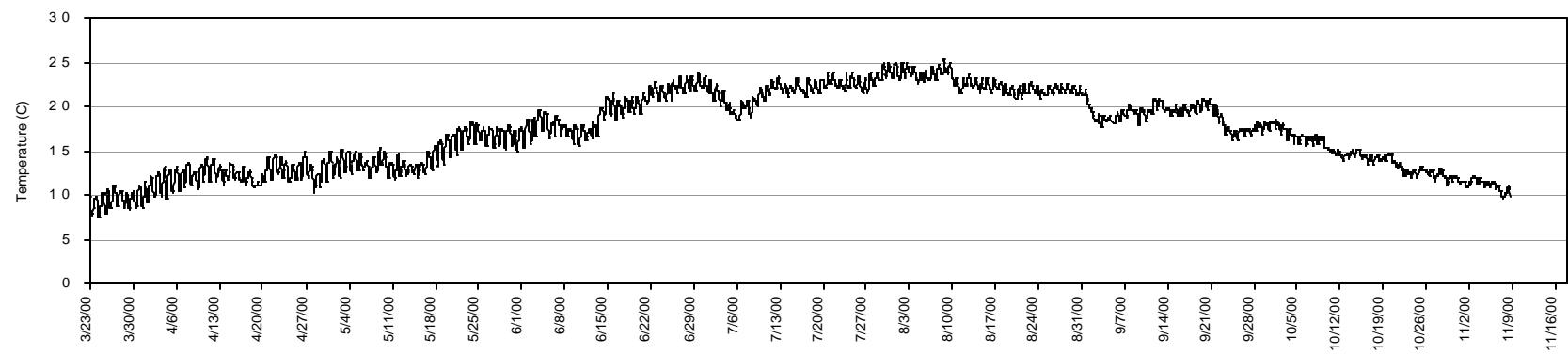
Klamath River observed daily mean, maximum, and minimum water temperature above Cottonwood Creek (RM 182)



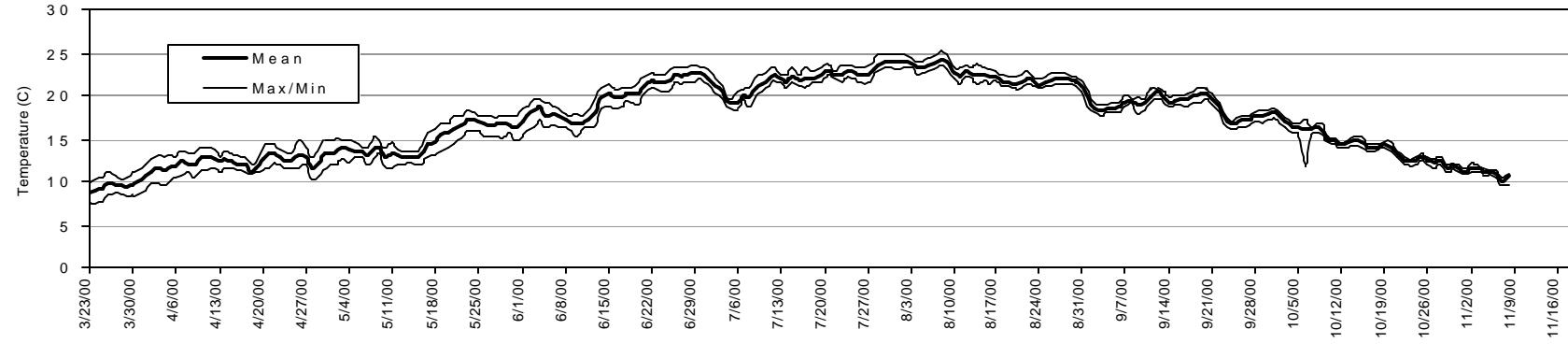
Klamath River observed hourly water temperature above Shasta River (RM 176.7)



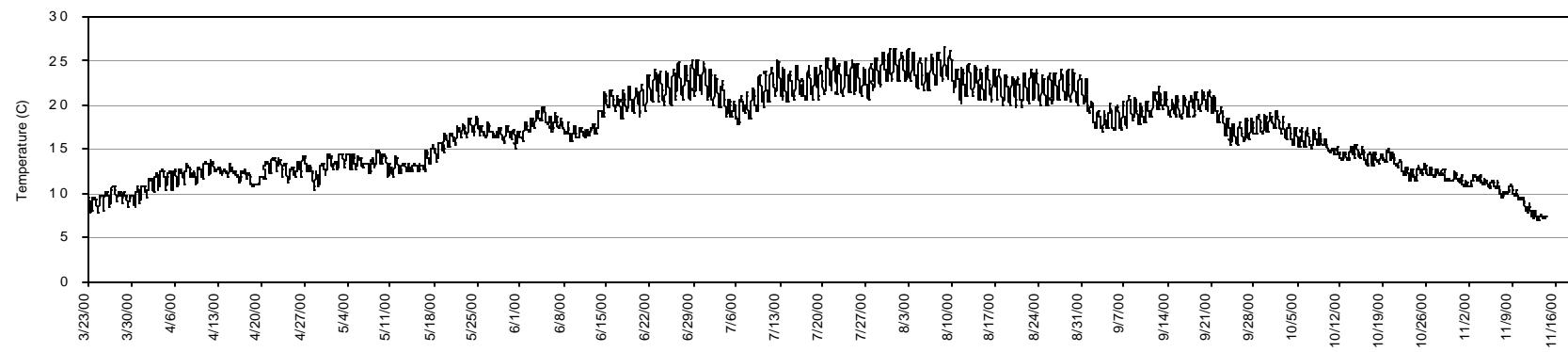
Klamath River observed daily mean, maximum, and minimum water temperature above Shasta River (RM 176.7)



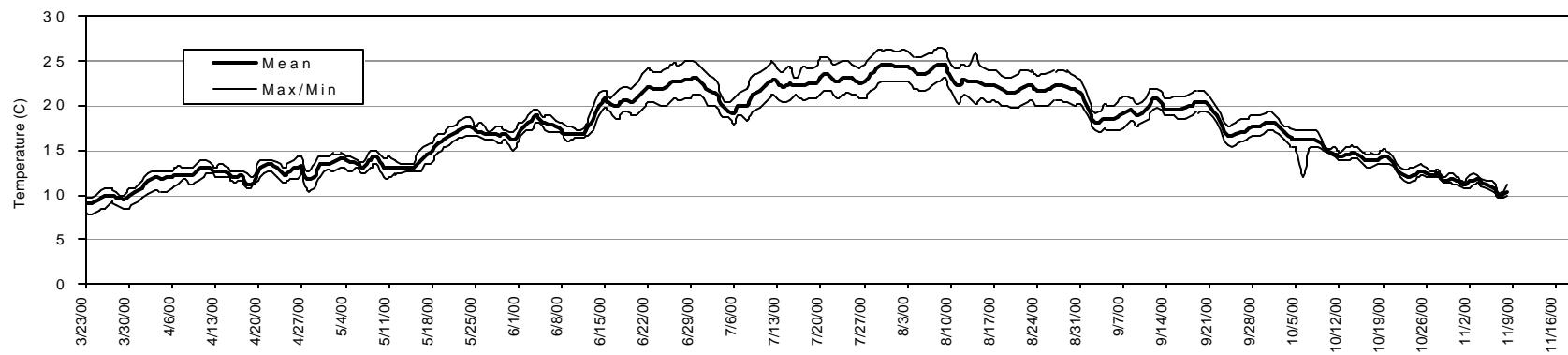
Klamath River observed hourly water temperature at Walker Road Bridge (RM 156)



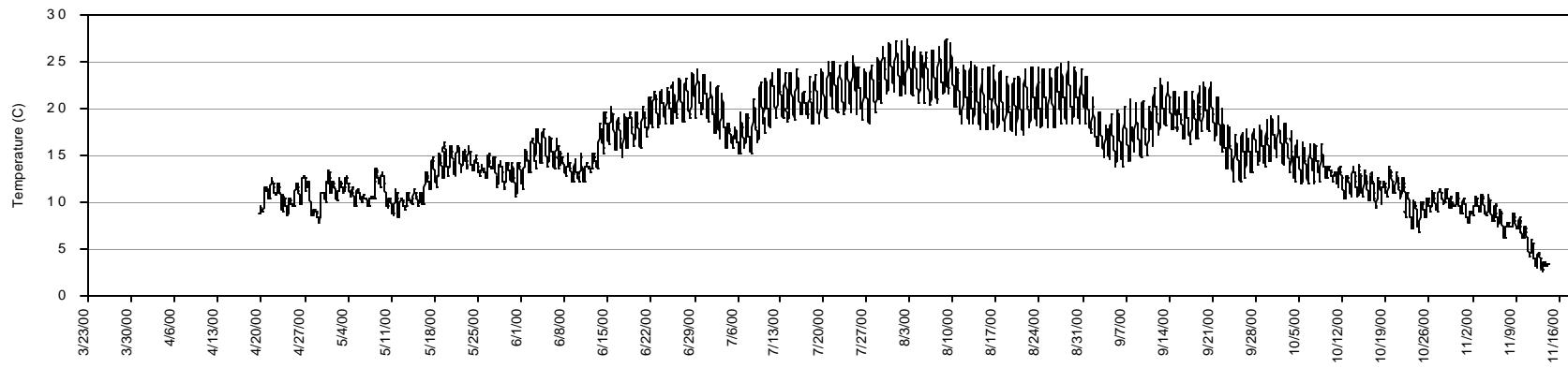
Klamath River observed daily mean, maximum, and minimum water temperature at Walker Road Bridge (RM 156.0)



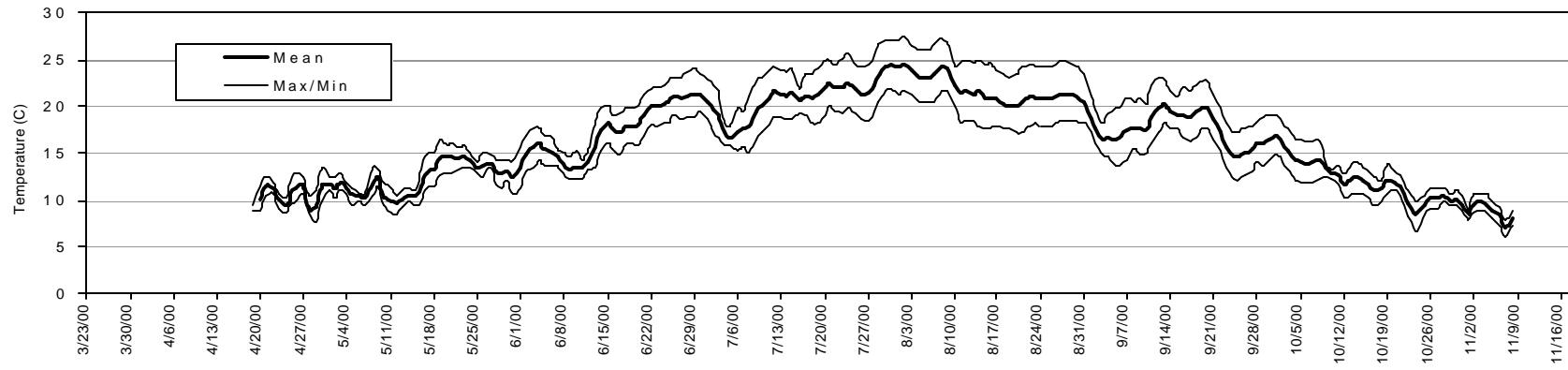
Klamath River observed hourly water temperature above Scott River (RM 143.5)



Klamath River observed daily mean, maximum, and minimum water temperature above Scott River (RM 143.5)



Scott River observed hourly water temperature, Scott River (RM 1)



Scott River observed daily mean, maximum, and minimum water temperature, Scott River (RM 1)

L TRACE ELEMENTS AND METALS DATA AND AQUATIC LIFE CRITERIA

Table L-1 Trace Elements and metals concentrations at screening locations: May 23, 2000

Parameter	KR @ Link Dam (mg/l)	FAL Criteria (mg/l)	KSD @ Hwy 97 (mg/l)	FAL Criteria (mg/l)	KR @ Keno (mg/l)	FAL Criteria (mg/l)	KR @ Iron Gate Dam (mg/l)	FAL Criteria (mg/l)
Aluminum	0.2	0.087	0.53	0.087	0.29	0.087	0.14	0.087
Antimony	<0.001	0.006**	<0.001	0.006**	<0.001	0.006**	<0.001	0.006**
Arsenic	0.0023	0.150	0.017	0.150	0.007	0.150	0.0031	0.150
Barium	0.0063	-	0.018	-	0.0096	-	0.0069	-
Cadmium*	<0.0005	0.001	<0.0005	0.0044	<0.0005	0.0024	<0.0005	0.0013
Calcium	7.8	-	43	-	20	-	11	-
Chromium*	<0.001	0.033	0.0015	0.16	<0.001	0.08	0.0014	0.044
Copper*	0.0011	0.0038	0.0033	0.02	0.0019	0.01	0.0026	0.005
Iron	0.21	1.0	0.51	1.0	0.31	1.0	0.16	1.0
Lead*	<0.001	0.00084	<0.001	0.007	0.002	0.003	0.0014	0.001
Magnesium	4.2	-	35	-	14	-	6.4	-
Mercury	0.00013	0.000012	0.000013	0.000012	0.00017	0.000012	0.000005	0.000012
Nickel*	0.0021	0.022	0.0054	0.113	0.0026	0.056	0.0034	0.031
Selenium	<0.001	0.005	<0.001	0.005	<0.001	0.005	<0.001	0.005
Silver*	<0.001	0.0006	<0.001	0.017	<0.001	0.0041	<0.001	0.0011
Thallium	<0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	0.002
Zinc*	<0.01	0.05	<0.01	0.25	<0.01	0.13	<0.01	0.068
Hardness	37	-	250	-	110	-	54	-

FAL Criteria – Freshwater Aquatic Life Criteria

Values in **BOLD** exceed FAL Criteria

* FAL criteria base on hardness (see: State of California, Regional Water Quality Control Board, Central Valley Region. 1998. *A Compilation of Water Quality Goals*. March)

Table L-2 Trace Elements and metals concentrations at screening locations: June 20, 2000

Parameter	KR @ Link Dam (mg/l)	FAL Criteria (mg/l)	KSD @ Hwy 97 (mg/l)	FAL Criteria (mg/l)	KR @ Keno (mg/l)	FAL Criteria (mg/l)	KR @ Iron Gate Dam (mg/l)	FAL Criteria (mg/l)
Aluminum	0.20	0.087	0.17	0.087	0.14	0.087	0.10	0.087
Antimony	<0.001	0.006**	<0.001	0.006**	<0.001	0.006**	<0.001	0.006**
Arsenic	0.0039	0.150	0.018	0.150	0.0059	0.150	0.005	0.150
Barium	0.0051	-	0.022	-	0.0066	-	0.0081	-
Cadmium*	<0.0005	0.00098	<0.0005	0.0036	<0.0005	0.0013	<0.0005	0.0018
Calcium	7.2	-	36	-	11	-	15	-
Chromium*	<0.001	0.03	0.0012	0.13	<0.001	0.043	0.0011	0.06
Copper*	0.002	0.0036	0.0031	0.016	0.0026	0.005	0.0033	0.007
Iron	0.31	1.0	0.65	1.0	0.24	1.0	0.1	1.0
Lead*	0.0035	0.0008	<0.001	0.005	<0.001	0.001	0.0012	0.002
Magnesium	3.9	-	25	-	6.0	-	9.5	-
Mercury	0.000012	0.000012	0.00040	0.000012	0.00025	0.000012	0.000016	0.000012
Nickel*	0.0032	0.021	0.0047	0.090	0.0029	0.030	0.0018	0.042
Selenium	<0.001	0.005	<0.001	0.005	<0.001	0.005	<0.001	0.005
Silver*	<0.001	0.0005	<0.001	0.01	<0.001	0.001	<0.001	0.0021
Thallium	<0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	0.002
Zinc*	<0.01	0.047	<0.01	0.200	<0.01	0.067	<0.01	0.095
Hardness	34	-	190	-	52	-	77	-

FAL Criteria – Freshwater Aquatic Life Criteria

Values in **BOLD** exceed FAL Criteria

* FAL criteria base on hardness (see: State of California, Regional Water Quality Control Board, Central Valley Region. 1998. *A Compilation of Water Quality Goals*. March)

Table L-3 Trace Elements and metals concentrations at screening locations: July 25, 2000

Parameter	KR @ Link Dam (mg/l)	FAL Criteria (mg/l)	KSD @ Hwy 97 (mg/l)	FAL Criteria (mg/l)	KR @ Keno (mg/l)	FAL Criteria (mg/l)	KR @ Iron Gate Dam (mg/l)	FAL Criteria (mg/l)
Aluminum	0.21	0.087	0.30	0.087	0.029	0.087	0.074	0.087
Antimony	0.0019	0.006*	<0.001	0.006*	<0.001	0.006*	<0.001	0.006*
Arsenic	0.0074	0.150	0.015	0.150	0.0093	0.150	0.0065	0.150
Cadmium*	<0.0005	0.00092	<0.0005	0.0021	<0.0005	0.0015	<0.0005	0.0015
Calcium	6.6	-	18	-	12	-	12	-
Chromium*	<0.001	0.028	<0.001	0.068	<0.001	0.05	<0.001	0.049
Copper*	0.0014	0.0032	0.0025	0.0082	0.0011	0.006	0.0010	0.006
Iron	0.29	1.0	0.65	1.0	0.11	1.0	0.049	1.0
Lead*	<0.001	0.0007	<0.001	0.002	<0.001	0.0015	<0.001	0.0014
Magnesium	3.4	-	11	-	7.6	-	7.2	-
Mercury	0.00000085	0.000012	0.0000067	0.000012	0.000017	0.000012	<0.000005	0.000012
Nickel*	<0.001	0.019	0.0028	0.048	0.0015	0.034	<0.001	0.034
Selenium	<0.001	0.005	<0.001	0.005	<0.001	0.005	0.0013	0.005
Silver*	<0.001	0.00043	<0.001	0.0029	<0.001	0.0014	<0.001	0.0014
Thallium	<0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	0.002
Zinc*	0.0038	0.042	0.0030	0.11	0.0080	0.077	0.0037	0.076
Hardness	30	-	90	-	61	-	60	-

FAL Criteria – Freshwater Aquatic Life Criteria

Values in **BOLD** exceed FAL Criteria

* FAL criteria base on hardness (see: State of California, Regional Water Quality Control Board, Central Valley Region. 1998. A Compilation of Water Quality Goals. March)

Table L-4 Trace Elements and metals concentrations at screening locations: September 26, 2000

Parameter	KR @ Link Dam (mg/l)	FAL Criteria (mg/l)	KSD @ Hwy 97 (mg/l)	FAL Criteria (mg/l)	KR @ Keno (mg/l)	FAL Criteria (mg/l)	KR @ Iron Gate Dam (mg/l)	FAL Criteria (mg/l)
Aluminum	0.67	0.087	0.22	0.087	3.0	0.087	0.052	0.087
Antimony	<0.001	0.006*	<0.001	0.006*	0.0018	0.006*	<0.001	0.006*
Arsenic	0.0071	0.150	0.013	0.150	0.0052	0.150	0.0058	0.150
Cadmium*	<0.0005	0.0011	<0.0005	0.0032	<0.0005	0.0019	<0.0005	0.0014
Calcium	8.5	-	32	-	17	-	12	-
Chromium*	0.0013	0.035	0.0018	0.11	0.0031	0.063	0.0014	0.047
Copper*	0.0015	0.004	0.0014	0.013	0.0024	0.007	<0.0003	0.005
Iron	<0.02	1.0	0.45	1.0	1.7	1.0	0.091	1.0
Lead*	<0.001	0.0009	<0.001	0.004	<0.001	0.002	<0.001	0.0013
Magnesium	4.5	-	19	-	9.8	-	6.8	-
Mercury	0.000011	0.000012	0.000012	0.000012	0.000010	0.000012	0.000015	0.000012
Nickel*	<0.001	0.024	0.0022	0.077	0.004	0.044	<0.001	0.032
Selenium	<0.001	0.005	<0.001	0.005	<0.001	0.005	<0.001	0.005
Silver*	<0.001	0.00071	<0.001	0.0077	<0.001	0.0025	<0.001	0.0013
Thallium	<0.001	0.002	<0.001	0.002	<0.001	0.002	<0.001	0.002
Zinc*	0.0024	0.054	0.0018	0.17	0.0054	0.098	<0.001	0.074
Hardness	40	-	160	-	83	-	58	-

FAL Criteria – Freshwater Aquatic Life Criteria

Values in **BOLD** exceed FAL Criteria

* FAL criteria base on hardness (see: State of California, Regional Water Quality Control Board, Central Valley Region. 1998. *A Compilation of Water Quality Goals*. March)

M BENTHIC ALGAE DATA

Benthic, or attached, algae data include two distinct types of information based on field methods used to determine algal growth rates. Both artificial substrate in the form of unglazed ceramic tiles and glass slides deployed in floating trays (floating periphyton sampler) were used. The ceramic tiles were attached to cinder blocks and placed on the streambed. Because of the high potential for grazing, floating periphyton samplers were also employed. The conditions of the ceramic tiles were likewise monitored and descriptions of conditions provided to augment the findings of the floating samplers

At each site three cinder blocks with two ceramic tiles each and three floating periphyton samplers with 8 slides each were deployed for two separate four week study periods in June and August. The two study sites included one above Cottonwood Creek and one below Iron Gate Dam.

The slides from the floating samplers were collected at periods ranging from 3 days to 8 days and sent to Basic Laboratory in Redding, California for chlorophyll a, dry weight, and ash free weight analysis. The information for each study period at each site is presented in Table M-1 and M-2, and graphically in Figure M-1. Field note summaries associated with both the floating samplers and ceramic tiles are provided in the following sections.

Table M-1 Results for chlorophyll a, dry weight, and ash-free weight from floating periphyton sampler slides: June 2000

Date Sampled	Location	Chlorophyll A (mg/m ³)	Dry Weight (g/m ²)	Ash-Free Weight (g/m ²)
6/14/2000	KR @ Cottonwood Creek	0.6	0.9	0.5
6/14/2000	KR @ Cottonwood Creek (duplicate)	-	0.6	3.5
6/14/2000	KR @ Cottonwood Creek (triplicate)	-	0.4	0.2
6/22/2000	KR @ Cottonwood Creek	237.0	5.9	3.3
6/22/2000	KR @ Cottonwood Creek (duplicate)	-	9.8	5.6
6/22/2000	KR @ Cottonwood Creek (triplicate)	-	9.7	5.7
6/26/2000	KR @ Cottonwood Creek	135.0	16.4	9.3
6/26/2000	KR @ Cottonwood Creek (duplicate)	-	14.8	8.7
6/26/2000	KR @ Cottonwood Creek (triplicate)	-	14.2	8.9
6/30/2000	KR @ Cottonwood Creek	53.8	28.4	19.6
6/30/2000	KR @ Cottonwood Creek (duplicate)	-	17.9	12.2
6/30/2000	KR @ Cottonwood Creek (triplicate)	-	8.8	6.2
6/14/2000	KR below Iron Gate Dam	1.2	5.2	3.0
6/14/2000	KR below Iron Gate Dam (duplicate)	-	2.2	1.3
6/14/2000	KR below Iron Gate Dam (triplicate)	-	4.1	2.7
6/22/2000	KR below Iron Gate Dam	39.2	18.5	7.9
6/22/2000	KR below Iron Gate Dam (duplicate)	-	25.9	13.7
6/22/2000	KR below Iron Gate Dam (triplicate)	-	42.0	22.9
6/26/2000	KR below Iron Gate Dam	26.3	14.9	7.3
6/26/2000	KR below Iron Gate Dam (duplicate)	-	5.5	2.7
6/26/2000	KR below Iron Gate Dam (triplicate)	-	34.1	18.3
6/30/2000	KR below Iron Gate Dam	32.0	9.1	6.6
6/30/2000	KR below Iron Gate Dam (duplicate)		11.7	8.2
6/30/2000	KR below Iron Gate Dam (triplicate)		11.1	8.0

Table M-2 Results for chlorophyll a, dry weight, and ash-free weight from floating periphyton sampler slides: August 2000

Date Sampled	Location	Chlorophyll A (mg/m ³)	Dry Weight (g/m ²)	Ash-Free Weight (g/m ²)
8/16/2000	KR @ Cottonwood Creek	1.4	0.2	0.1
8/16/2000	KR @ Cottonwood Creek (duplicate)	-	0.0	0.0
8/16/2000	KR @ Cottonwood Creek (triplicate)	-	0.2	0.2
8/21/2000	KR @ Cottonwood Creek	8.2	1.2	0.7
8/21/2000	KR @ Cottonwood Creek (duplicate)	-	0.4	0.2
8/21/2000	KR @ Cottonwood Creek (triplicate)	-	1.8	1.0
8/23/2000	KR @ Cottonwood Creek	43.4	0.7	0.2
8/23/2000	KR @ Cottonwood Creek (duplicate)	-	1.2	0.5
8/23/2000	KR @ Cottonwood Creek (triplicate)	-	1.3	0.7
8/28/2000	KR @ Cottonwood Creek	14.2	1.2	0.6
8/28/2000	KR @ Cottonwood Creek (duplicate)	-	1.5	0.2
8/28/2000	KR @ Cottonwood Creek (triplicate)	-	3.2	1.6
8/16/2000	KR below Iron Gate Dam	4.6	0.5	0.3
8/16/2000	KR below Iron Gate Dam (duplicate)	-	0.3	0.2
8/16/2000	KR below Iron Gate Dam (triplicate)	-	0.3	0.3
8/21/2000	KR below Iron Gate Dam	33.8	1.3	0.2
8/21/2000	KR below Iron Gate Dam (duplicate)	-	5.5	2.2
8/21/2000	KR below Iron Gate Dam (triplicate)	-	2.8	1.5
8/23/2000	KR below Iron Gate Dam	32.8	9.2	2.6
8/23/2000	KR below Iron Gate Dam (duplicate)	-	10.9	4.2
8/23/2000	KR below Iron Gate Dam (triplicate)	-	16.5	4.2
8/28/2000	KR below Iron Gate Dam	101.0	12.5	5.3
8/28/2000	KR below Iron Gate Dam (duplicate)	-	10.6	3.6
8/28/2000	KR below Iron Gate Dam (triplicate)	-	14.8	5.8

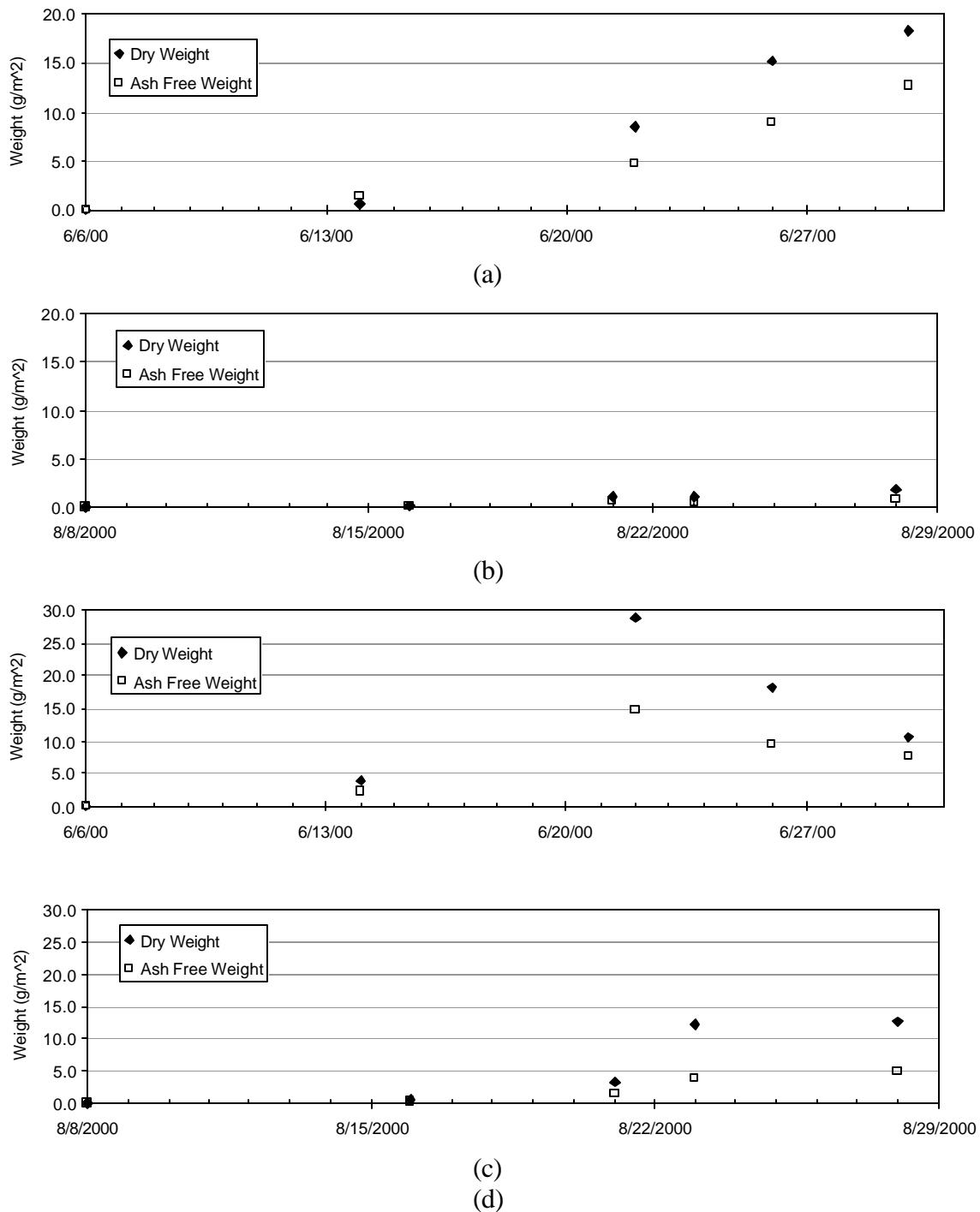


Figure M-1 Periphyton sample dry weight and ash free weight for (a) Cottonwood Creek: June, (b) Cottonwood Creek site: August, (c) Iron Gate Dam site: June, and (d) Iron Gate Dam site: August

M.1.1 Floating Periphyton Sampler: field notes summary

Cottonwood Creek Site

June 6, 2000: Deployment

June 14, 2000

Heavy macrophyte buildup on the samplers (from upstream reaches). Heavy load reduces light penetration and submerges sampler 3 to 4 inches. Only minimal growth noted on slides. Install t-post (remove weights) upstream of sampler to diminish impact of detached macrophyte buildup. Visit sampler more frequently to remove any buildup of material

June 22, 2000

Little or no macrophyte buildup (t-post successful in capturing much of the floating material). “Good” growth noted on slides. Two slides missing on one sampler. (Certain slides tended to move arrhythmically in the tray in response to local velocity field. It is postulated that these slides broke and fell out of the sampler). Minor grazing notes on select slides. One sampler had 12 snails. No other grazers noted. Snails removed.

June 26, 2000

Little or no macrophyte buildup. No grazing. Good growth.

June 29, 2000

Results varied from good to poor growth. Samplers are now accumulating appreciable growth (possibly affecting water flow and light to slide tray). Some snails present on one sampler – no grazing noted on slides. One sampler covered with debris and brown growth on slides.

Iron Gate Dam Site Deployment

June 6, 2000: Deployment

June 14, 2000

Minimal macrophyte buildup on samplers. Samplers sitting on surface. “good” growth notable on select slides. Install t-post to secure samplers

June 22, 2000

Most slides showed considerable growth. However, one tray had minimal growth and what was growing was brown in color. No grazing noted. Macrophyte buildup was minimal. There were chew marks on one of the sampler floats (possibly beaver, muskrat, or otter)

June 26, 2000

Wide range of conditions among three samplers. One experienced significant growth, one modest growth, and one poor growth. By visual inspection (and photographs) the sampler that exhibited poor growth appeared to have less algae than the previous week sample.

June 29, 2000

Experienced macrophyte buildup on one sampler. Conditions appear to have degraded. Algae dieback on many slides. Growth is arrested. Six snails found on one sampler. No grazing noted.

Cottonwood Creek Site

August 8, 2000: Deployment

August 16, 2000

No macrophyte buildup noted, although sampler shield eddy attracted several smaller types of algae (e.g., duckweed). Minimal growth noted.

August 21, 2000

No macrophyte buildup noted. Good growth noted. No snails, no sign of grazing observed.

August 23, 2000

No macrophyte buildup noted. Change in algal growth (brown), not as significant as during last visit. No snails, no sign of grazing observed.

August 28, 2000

Some macrophyte buildup on samplers. Growth appears to be slowing (brown). A few snails noted on one sampler, no clear evidence of grazing.

Iron Gate Dam Site Deployment

August 8, 2000: Deployment

August 16, 2000

No macrophyte buildup noted. Samplers completely covered with black fly larvae (1000's) and small colonies of caddis flies (?) All slides appear to be completely grazed.

August 21, 2000

No macrophyte buildup noted. Only remnant caddis fly populations. Old cases discarded. Effect of invertebrates still affecting growth, but certain slides show good growth.

August 23, 2000

No macrophyte buildup noted. Fewer invertebrates (<100 per tray). Good growth (brown) noted on all samplers.

August 28, 2000

No macrophyte buildup noted. Very few invertebrates. Significant growth continues (brown and some green).

M.1.2 Artificial Substrate: field notes summary

Cottonwood Creek Site

June 6, 2000: Deployment

Three cinder blocks with cleaned tiles were deployed in 2 to 3 feet of water (velocity 1-3 fps) approximately 25 feet from the left bank above the fishing weir. There was no potential shading from riparian vegetation (woody or herbaceous) at this location. The substrate consists predominantly of medium to large cobbles. Significant amounts of attached algae were already present in the river. Existing attached algae was removed and/or trimmed so as not to cover or abrade the artificial substrate.

June 14, 2000

The tile deployed under floating periphyton sampler moved two feet upstream due to shading from large amounts of algae that become tangled on the t-post to which the floating sampler is attached. Snails counts range from 14 to 70 per tile. No other benthic fauna present. Tiles are grazed clean, although they are “slick” to the touch and there is some staining (brown). No interference from attached algae external to the tile (those growing on the bed versus the tile).

June 22, 2000

Snails counts range from an estimate of 35 to over 75 per tile. Two limpets found on one artificial substrate. No other benthic fauna noted. Tiles are grazed clean, although they are “slick” to the touch and there is some staining (brown). One tile was affected by external attached algae washing over the surface. No interference from attached algae external to the tile (those growing on the bed versus the tile).

June 26, 2000

Snails counts for all tiles range are in excess of 75. No other grazers noted. Tiles are grazed clean, although they are “slick” to the touch.

June 29, 2000

Snails counts for all tiles range are in excess of 75. A few limpets noted. Tiles are grazed clean, although they are “slick” to the touch and there is some staining (brown).

Iron Gate Dam Site Deployment

June 6, 2000: Deployment

Three cinder blocks with cleaned tiles were deployed in 2 to 3 feet of water (velocity 1-3 fps) approximately 6 feet from the left bank below the fish hatchery raceways. There was minor potential shading from riparian vegetation (some trees present and herbaceous (cattail/bulrush) was present) at this location. The substrate consists predominantly of large cobbles. Significant amounts of attached algae were already present in the river. Existing attached algae was removed and/or trimmed so as not to cover or abrade the artificial substrate.

June 14, 2000

Snails counts range from 2 to 3 per tile (it is noted that they are “large” (>5 mm) – comparison presumed to be with those found at Cottonwood Creek (typically <5 mm)).

Benthic fauna include mayfly larvae and black fly larvae. Tiles are only modestly grazed. Growth on the substrate noted as "good." No interference from attached algae external to the tile (those growing on the bed versus the tile).

June 22, 2000

Snails counts range from an estimate of 6 to over 20 per tile. It is noted that there appear to be at least two separate species (1-11 mm). Up to 40 limpets (1-7 mm) found on artificial substrate. With flow change, some tiles are in faster moving water. Mayfly larvae present, with an apparent preference for that substrate in the slower water. Some tiles appear to be heavily grazed by mayfly larvae. Noted that there may be more than one species of algae colonizing substrate ("brown" and "green"). Even with grazing, growth continues to be described as "good." No interference from attached algae external to the tile (those growing on the bed versus the tile).

June 26, 2000

Snails counts range from an estimate of 2 to over 12 per tile. Up to 40 limpets found on artificial substrate. Small mayflies present. Noted that there may be more than one species of algae colonizing substrate ("brown" and "green"). Grazing has increased to the point where certain tiles are completely grazed, others partially grazed.

June 29, 2000

Those tiles in shallower water experienced greater limpet counts than snails. Limpets ranged were on the order of 20-30, while snails numbered less than 10. On the substrate in deeper water there were roughly 75 snails and limpets per tile in roughly equal proportion. The shallow water substrates had two observable type of algae (brown and green) and grazing ranged from almost none to moderate. The deeper water substrate was completely grazed clean.

Cottonwood Creek Site

August 8, 2000: Deployment

Tiles were cleaned and replaced in similar location as for June deployment. More attached algae present. Existing attached algae in vicinity was removed and/or trimmed so as not to cover or abrade the artificial substrate. Depths were slightly less and velocities were slower than June deployment.

August 16, 2000

Snails counts range from an estimate of 20 to 45 per tile. No other benthic fauna noted. Tiles are grazed clean. One cinder block was cracked and a small tile corner had broken off, but the artificial substrate was still useful. No interference from attached algae external to the tile (those growing on the bed versus the tile) is noted.

August 21, 2000

Snails counts range 25 to 35 per tile. No other benthic fauna noted. Tiles are heavily grazed, but there is greenish brown growth (slick to the touch) on some tiles. No interference from attached algae external to the tile (those growing on the bed versus the tile) is noted.

August 23, 2000

Snails counts range 10 to 15 per tile. Noted that fewer snails and limpets were present. No other benthic fauna noted. Tiles are heavily grazed, but there is greenish growth (slick to the touch) noted on some tiles. No interference from attached algae external to the tile is noted.

August 28, 2000

Snails counts range was generally greater than 50 per tile. No limpets were noted. No other benthic fauna noted. Tiles are heavily grazed, but there is greenish growth on some tiles and brownish on others. No interference from attached algae external to the tile is noted.

Iron Gate Dam Site

August 8, 2000: Deployment

Tiles were cleaned and replaced in similar location as for June deployment. More attached algae present. Existing attached algae in vicinity was removed and/or trimmed so as not to cover or abrade the artificial substrate. Depths were slightly less and velocities were slower than June deployment.

August 16, 2000

Snails counts range from an estimate of 5 to 15 per tile. Other benthic fauna included 3 water pennies, a few black fly larvae. Variable growth, including brown "spotting" and a brown/green slime forming on certain tiles. Some grazing present, but generally little growth. Some interference from attached algae external to the tile is noted for one cinder block. Where algae abrade, there is little growth.

August 21, 2000

About 30 snails and from 10-15 limpets, plus several water pennies present. No other benthic fauna noted. Some tiles were moderately grazed with preference to the margins (edges), while others were completely grazed. The mottled brown spotting first seen on 8/12 was present. No interference from attached algae external to the tile is noted.

August 23, 2000

Snails counts range 10 to 15 per tile. Noted that there were fewer snails and limpets. No other benthic fauna noted. Tiles are heavily grazed, but there is greenish growth (slick to the touch) noted on some tiles. No interference from attached algae external to the tile (those growing on the bed versus the tile) is noted.

August 28, 2000

Snails and limpets grazing ranged from modest (grazing the periphery of the tiles) to completely grazing certain substrate clean. Snails ranged in number from 25 to 35. Limpet numbers unreported. No other benthic fauna reported. No interference from attached algae external to the tile (those growing on the bed versus the tile) is noted.

N RESERVOIR WATER QUALITY DATA: GRAB SAMPLES

In addition to the grab samples collected primarily by USBR and supported staff, PacifiCorp collected grab samples in the mainstem reservoirs: JC Boyle, Copco, and Iron Gate. Samples were collected at approximately monthly intervals at two depths in JC Boyle (with the exception of the first sampling period), and at three depths in Copco and Iron Gate Reservoirs. The near surface and near bottom samples in JC Boyle are termed epilimnion and hypolimnion respectively, even though this reservoir experiences weak stratification. The three depths in Copco and Iron Gate Reservoirs are termed epilimnion, metalimnion and hypolimnion, respectively.

The constituents sampled include ammonia, total Kjeldahl nitrogen, nitrate+nitrite, total phosphorous, orthophosphate, and BOD. Chlorophyll a samples were collected, but laboratory performance was unsatisfactory and data should be used with caution. Unlike the larger Klamath River sampling program, there were insufficient few data points (sampling days) to estimate values below the reporting limit or to estimate meaningful statistics. There are only a few dates where nutrient data are below the reporting limit, when plotted in Appendix O, these values are plotted at the reporting limit. During the field sampling events, physical data were collected with a water quality probe (see also *Reservoir Water Quality Data: Physical Profiles*. Tabulated reservoir grab sample data are included below.

Table N-1 JC Boyle Reservoir grab sample data: May – November 2000

Site	Date	Depth (m)	NH ₄ ⁺ (mg/l)	TKN (mg/l)	NO ₃ ⁻ +NO ₂ ⁻ (mg/l)	TP (mg/l)	PO ₄ ³⁻ (mg/l)	BOD (mg/l)	Chlor a (mg/m ³)	T _w (C)	DO (mg/L)	EC (uS/cm)	pH	Redox mV
JCB-E	05/09/00	1.0	0.21	1.0	0.19	0.20	0.24	<3.0	2.67j	13.63	9.88	151	7.93	-
JCB-E	06/06/00	1.0	0.16	1.5	0.64	0.38	0.33	<3.0	20.0	19.34	9.72	251	8.77	-
JCB-E	08/08/00	0.9	0.16	1.0	1.36	0.29	0.28	<3.0	0j	24.35	7.83	154	7.67	-
JCB-E	09/27/00	1.0	0.14	1.4	0.62	0.24	0.20	<3.0	0j	15.50	7.56	261	8.45	-
JCB-E	10/18/00	1.0	0.16	1.1	0.60	0.16	0.09	<3.0	3j	10.58	10.59	157	7.52	-
JCB-E	11/14/00	1.0	0.14	1.2	0.78	0.06	0.07	<3.0	2j	3.87	9.28	156	7.66	-
JCB-M	05/09/00	4.0	0.42	0.7	0.18	0.21	0.21	<3.0	2.00j	13.63	9.83	151	7.98	-
JCB-H	05/09/00	8.0	0.56	0.6	0.21	0.30	0.18	<3.0	1.67j	13.16	9.43	150	7.86	-
JCB-H	06/06/00	7.0	0.21	1.0	0.63	0.22	0.34	<3.0	4.38j	19.15	8.23	259	8.54	-
JCB-H	08/08/00	7.6	0.30	1.7	1.55	0.27	0.23	<3.0	0j	22.83	2.10	154	6.94	-
JCB-H	09/27/00	9.0	0.17	1.4	0.59	0.25	0.21	4.0	2j	15.50	6.69	257	8.35	-
JCB-H	10/18/00	7.0	0.15	1.2	0.63	0.16	0.09	<3.0	0j	10.66	10.04	160	7.61	-
JCB-H	11/14/00	5.0	0.14	0.9	0.79	0.06	0.07	<3.0	2j	3.91	8.90	159	7.64	-

(<) less than reporting limit

(i) below reporting limit of 40 ug/l

(-) No data available

Table N-2 Copco Reservoir grab sample data: May – November 2000

Site	Date	Depth (m)	NH ₄ ⁺ (mg/l)	TKN (mg/l)	NO ₃ ⁻ +NO ₂ ⁻ (mg/l)	TP (mg/l)	PO ₄ ³⁻ (mg/l)	BOD (mg/l)	Chlor a (mg/m ³)	T _w (C)	DO (mg/L)	EC (uS/cm)	pH	Redox mV
COP-E	05/09/00	1.0	0.39	0.7	0.06	0.18	0.16	<3.0	6.14j	14.29	11.52	148	8.55	-
COP-E	06/06/00	1.0	0.10	1.2	0.40	0.36	0.31	<3.0	9.88j	19.24	11.97	245	8.91	-
COP-E	08/08/00	1.0	0.05	0.9	0.47	0.17	0.23	<3.0	11j	23.41	13.08	168	9.05	-
COP-E	09/27/00	1.0	<0.05	2.1	0.25	0.26	0.10	15.0	31j	17.50	7.94	195	8.75	-
COP-E	10/18/00	1.0	0.12	0.7	0.55	0.20	0.14	<3.0	0j	13.56	10.47	201	7.66	-
COP-E	11/14/00	1.0	0.09	0.6	0.57	0.09	0.09	<3.0	0j	8.26	8.50	141	8.45	-
COP-M	05/09/00	12.0	0.73	0.5	0.15	0.17	0.19	<3.0	5.34j	13.28	9.31	147	7.95	-
COP-M	06/06/00	14.0	0.32	0.9	0.42	0.26	0.29	<3.0	0.53j	14.26	5.81	221	7.61	-
COP-M	08/08/00	17.0	0.17	0.5	0.62	0.29	0.29	<3.0	2j	19.95	2.10	172	7.13	-
COP-M	09/27/00	15.0	0.29	1.1	0.34	0.22	0.21	<3.0	1j	16.00	3.42	217	8.18	-
COP-M	10/18/00	15.0	0.11	0.8	0.56	0.17	0.11	<3.0	1j	12.35	10.19	182	7.74	-
COP-M	11/14/00		0.10	0.6	0.59	0.08	0.08	<3.0	0j	7.84	0.07	143	7.90	-
COP-H	05/09/00	25.0	0.51	1.2	0.29	0.55	0.35	<3.0	2.93j	10.16	2.36	162	7.23	24
COP-H	06/06/00	25.0	0.68	1.1	0.97	0.51	0.42	<3.0	<0.01j	11.54	0.48	195	7.14	-
COP-H	08/08/00	28.0	0.99	1.3	1.11	0.65	0.54	<3.0	1j	12.78	0.34	180	6.84	-
COP-H	09/27/00	29.0	1.60	2.6	<0.05	0.78	0.61	11.0	1j	14.70	0.10	210	7.80	-
COP-H	10/18/00	25.0	0.10	0.7	0.56	0.16	0.10	<3.0	1j	11.89	12.27	173	7.90	-
COP-H	11/14/00	26.0	0.08	0.6	0.59	0.08	0.07	<3.0	2j	7.13	4.87	146	7.76	-

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) No data available

Table N-3 Iron Gate Reservoir grab sample data: May – November 2000

Site	Date	Depth (m)	NH ₄ ⁺ (mg/l)	TKN (mg/l)	NO ₃ ⁻ +NO ₂ ⁻ (mg/l)	TP (mg/l)	PO ₄ ³⁻ (mg/l)	BOD (mg/l)	Chlor a (mg/m ³)	T _w (C)	DO (mg/L)	EC (uS/cm)	pH	Redox mV
IG-E	05/09/00	1.0	0.07	0.9	0.10	0.13	0.18	<3.0	4.54j	14.26	10.71	147	8.42	-
IG-E	06/06/00	1.0	0.28	0.9	0.28	0.34	0.24	<3.0	9.35j	19.65	11.90	225	8.83	-
IG-E	08/08/00	1.0	<0.05	1.2	<0.05	0.13	0.13	5.0	46	25.25	15.85	162	9.46	-
IG-E	09/27/00	1.0	<0.05	0.8	0.58	0.17	0.15	<3.0	3j	18.40	7.50	176	7.58	-
IG-E	10/18/00	1.0	0.06	0.5	0.53	0.19	0.14	<3.0	2j	14.93	6.46	210	7.50	-
IG-E	11/14/00	1.0	0.12	0.3	0.69	0.12	0.12	<3.0	3j	9.84	6.55	155	7.70	-
IG-M	05/09/00	15.0	0.73	0.8	0.26	0.16	0.19	<3.0	1.07j	11.33	8.40	148	7.61	14
IG-M	06/06/00	13.0	0.07	0.6	0.24	0.15	0.24	<3.0	<0.01j	12.28	7.38	169	7.63	-
IG-M	08/08/00	17.0	0.06	<0.2	0.31	0.11	0.12	<3.0	0j	16.44	2.36	207	7.10	-
IG-M	09/27/00	15.0	0.11	0.7	0.57	0.17	0.16	<3.0	0j	16.67	1.84	4.7	7.31	-
IG-M	10/18/00	25.0	0.11	0.3	0.16	0.24	0.20	<3.0	4j	9.87	2.61	191	7.30	-
IG-M	11/14/00		0.09	0.5	0.66	0.07	0.12	<3.0	0j	9.80	0.09	156	7.61	-
IG-H	05/09/00	30.0	0.13	0.6	0.38	0.23	0.21	<3.0	<0.01j	6.28	7.27	171	7.35	-
IG-H	06/06/00	30.0	0.05	0.5	0.49	0.25	0.29	<3.0	<0.01j	6.43	5.25	172	7.14	-
IG-H	08/08/00	30.0	0.06	<0.2	0.52	0.12	0.12	<3.0	0j	7.07	0.43	157	6.71	-
IG-H	09/27/00	30.0	0.12	0.7	0.38	0.17	0.17	<3.0	1j	7.74	0.33	192	6.89	-
IG-H	10/18/00	30.0	0.21	0.5	0.28	0.21	0.17	<3.0	2j	8.02	1.65	194	7.12	-
IG-H	11/14/00	30.0	0.09	0.6	0.56	0.07	0.12	<3.0	1j	9.16	6.83	150	7.55	-

(<) less than reporting limit

(j) below reporting limit of 40 ug/l

(-) No data available

O RESERVOIR WATER QUALITY DATA: GRAB SAMPLES, GRAPHICAL REPRESENTATION BY SITE

Unlike the large Klamath River sampling program, there were too few data points (sampling days) to estimate values below the reporting limit or to estimate meaningful statistics. There are only a few dates where nutrient data are below the reporting limit, these values are plotted at the reporting limit (denoted with an open symbol).

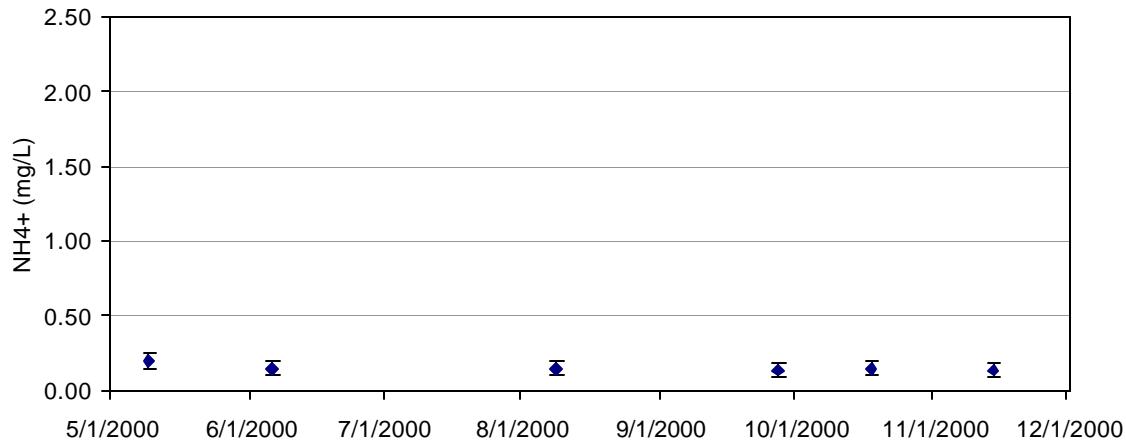


Figure O-1 JC Boyle Reservoir epilimnion, ammonia concentration, May – November 2000

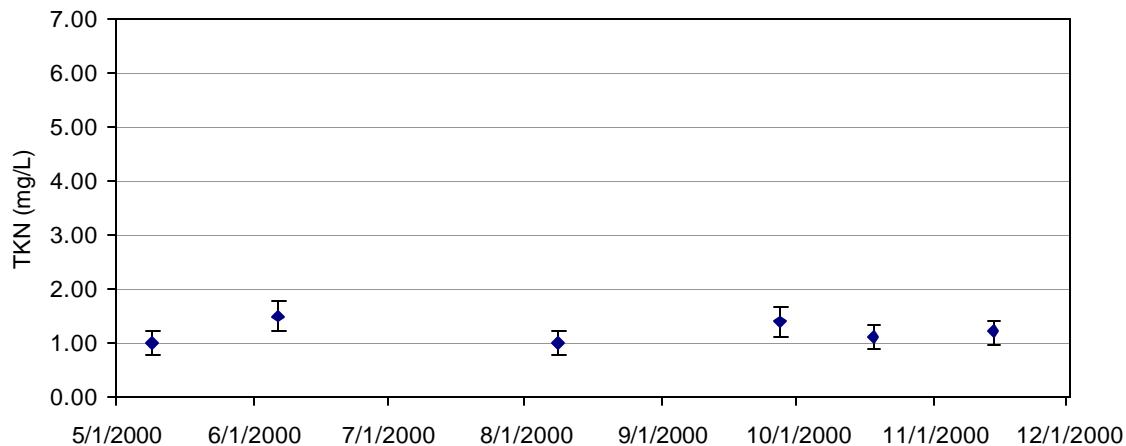


Figure O-2 JC Boyle Reservoir epilimnion, total Kjeldahl nitrogen concentration, May – November 2000

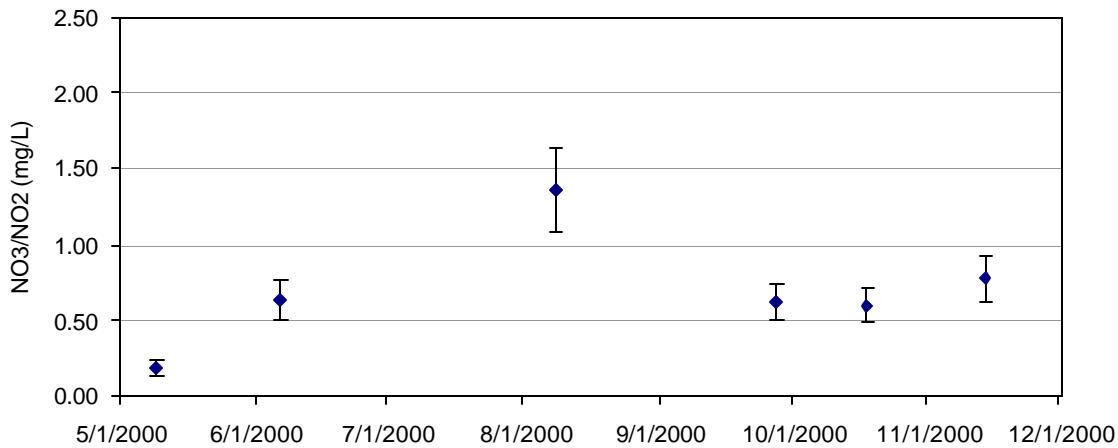


Figure O-3 JC Boyle Reservoir epilimnion, nitrite plus nitrate concentration, May – November 2000

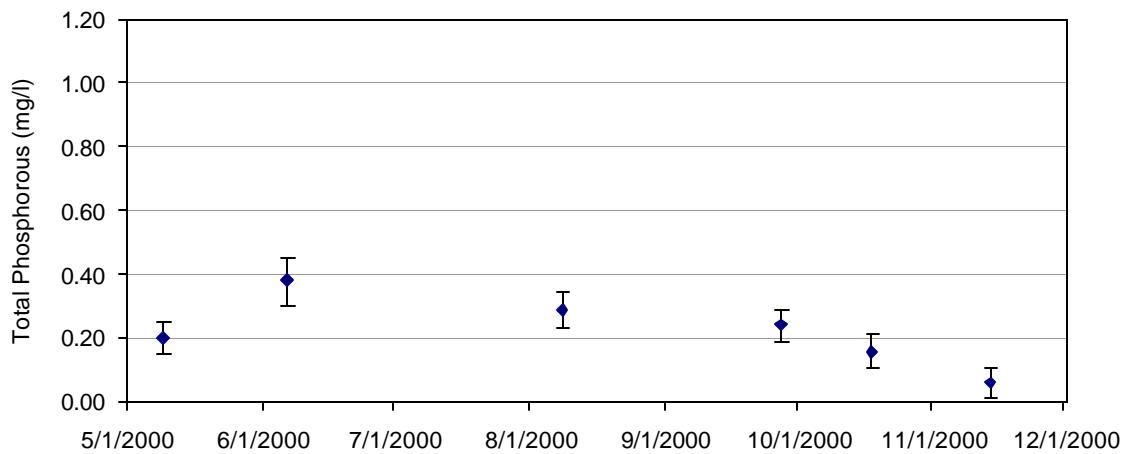


Figure O-4 JC Boyle Reservoir epilimnion, total phosphorous concentration, May – November 2000

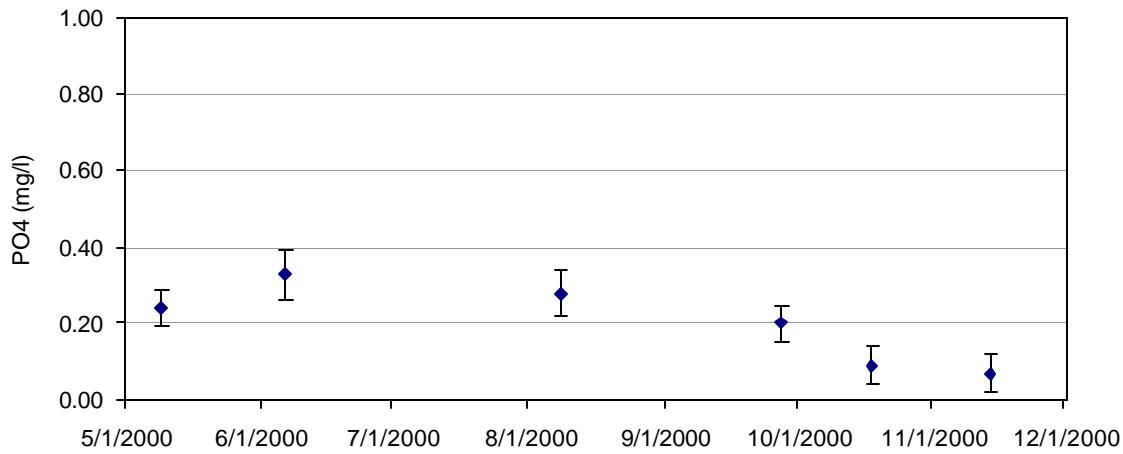


Figure O-5 JC Boyle Reservoir epilimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l]

Figure O-6 JC Boyle Reservoir epilimnion, BOD concentration, May – November 2000

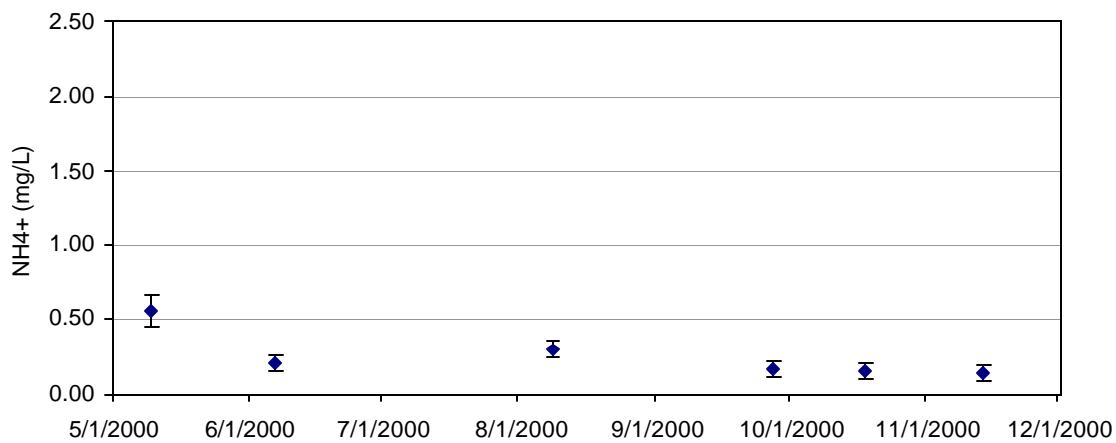


Figure O-7 JC Boyle Reservoir hypolimnion, ammonia concentration, May – November 2000

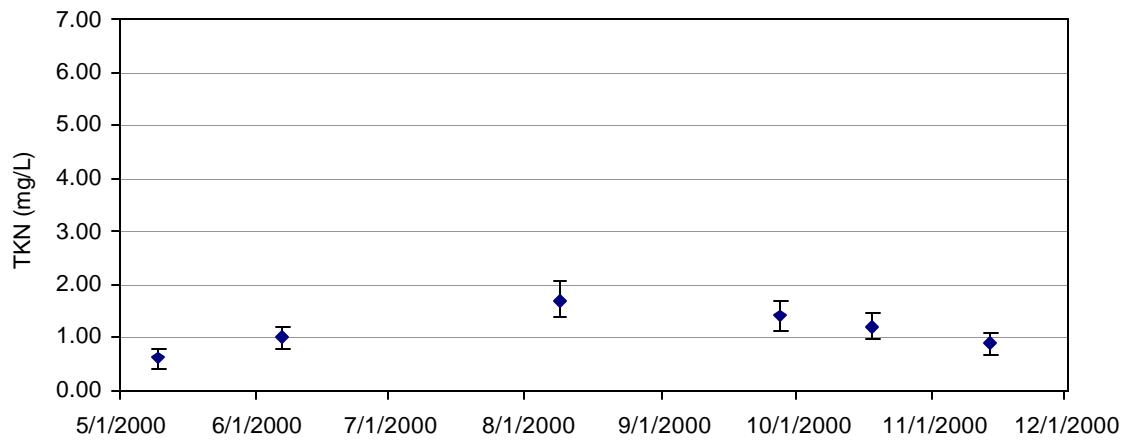


Figure O-8 JC Boyle Reservoir hypolimnion, total Kjeldahl nitrogen concentration, May – November 2000

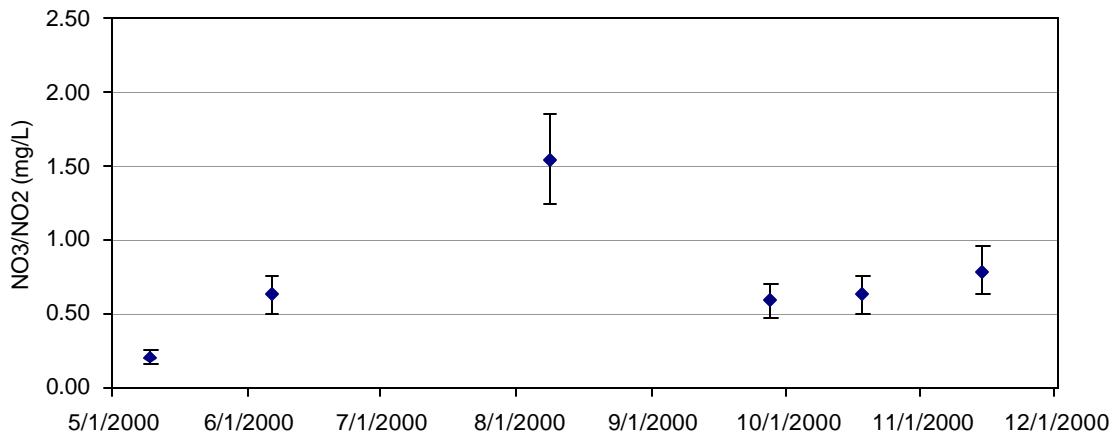


Figure O-9 JC Boyle Reservoir hypolimnion, nitrite plus nitrate concentration, May – November 2000

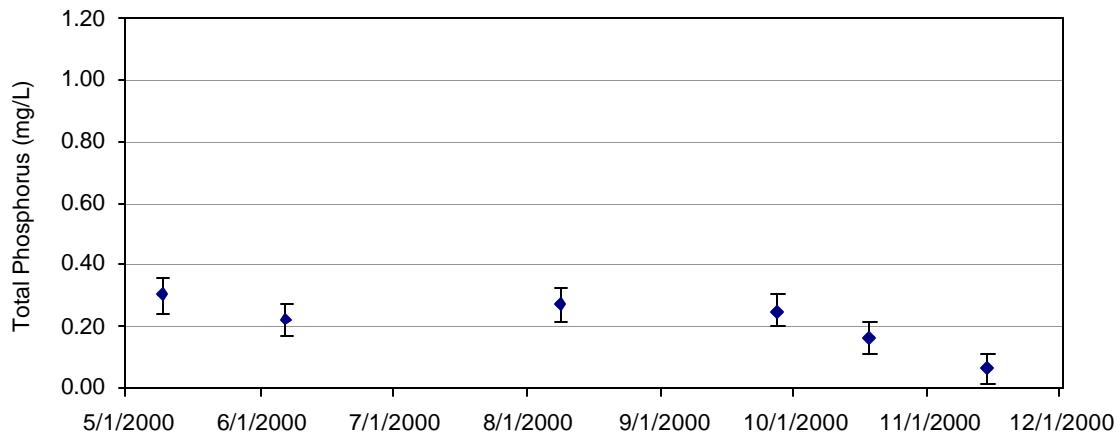


Figure O-10 JC Boyle Reservoir hypolimnion, total phosphorous concentration, May – November 2000

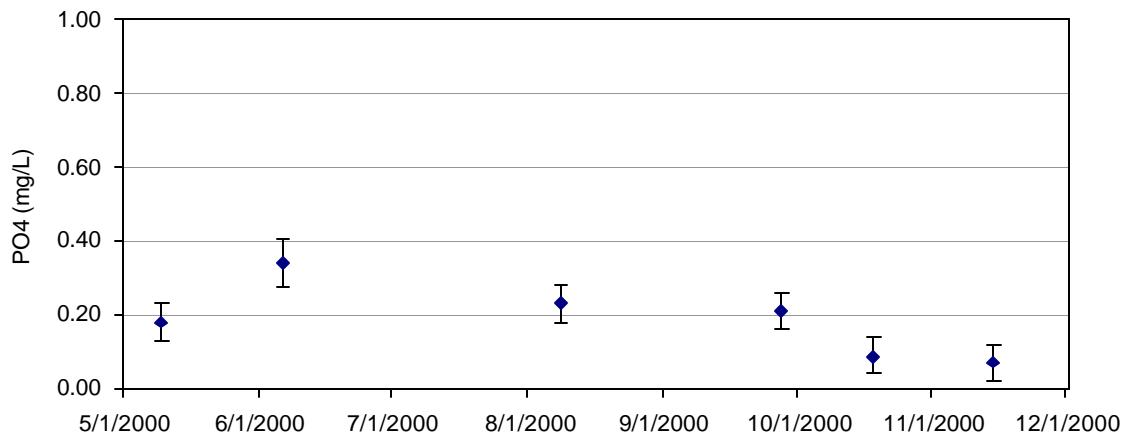


Figure O-11 JC Boyle Reservoir hypolimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l]

Figure O-12 JC Boyle Reservoir hypolimnion, BOD concentration, May – November 2000

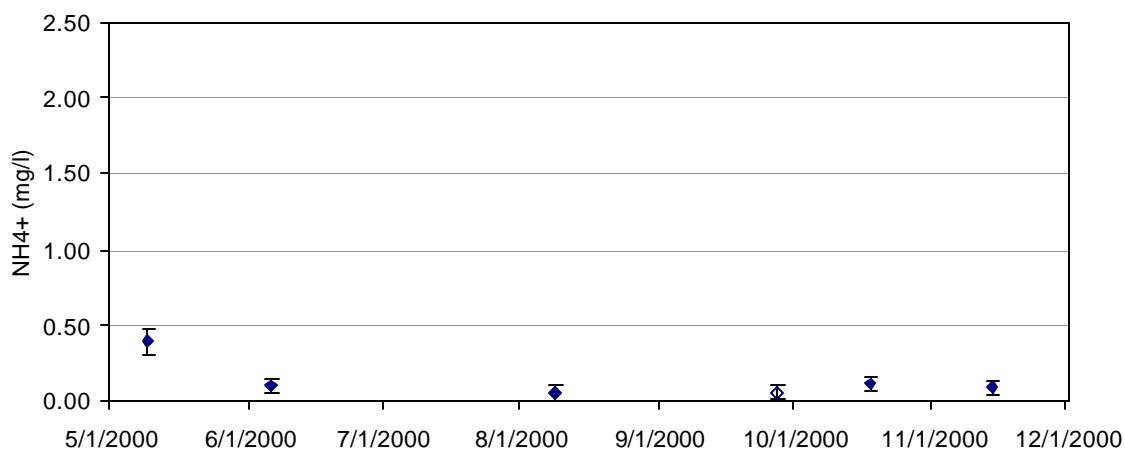


Figure O-13 Copco No. 1 Reservoir epilimnion, ammonia concentration, May – November 2000

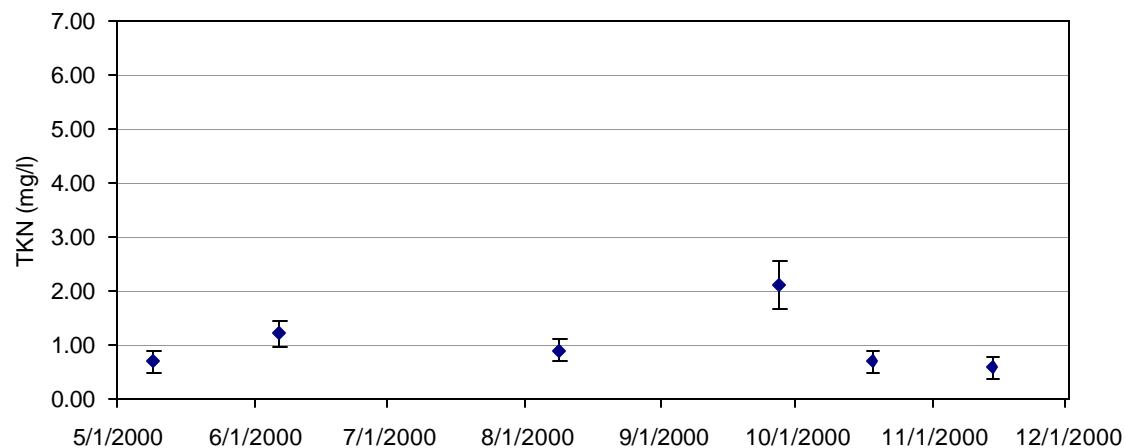


Figure O-14 Copco No. 1 Reservoir epilimnion, total Kjeldahl nitrogen concentration, May – November 2000

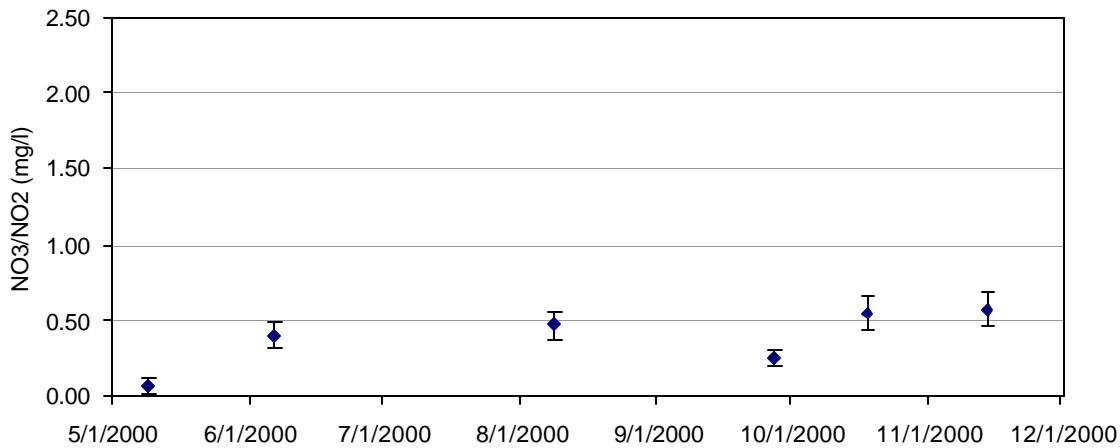


Figure O-15 Copco No. 1 Reservoir epilimnion, nitrite plus nitrate concentration, May – November 2000

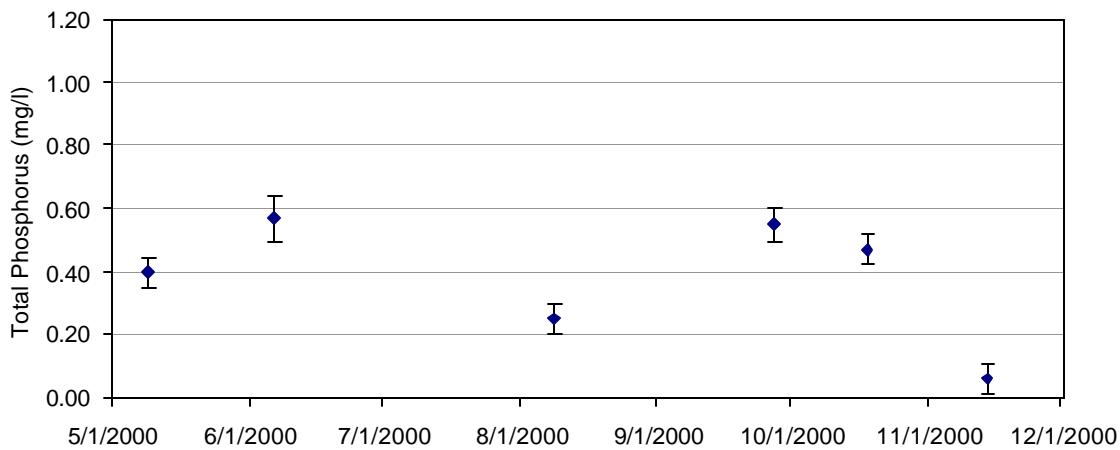


Figure O-16 Copco No. 1 Reservoir epilimnion, total phosphorous concentration, May – November 2000

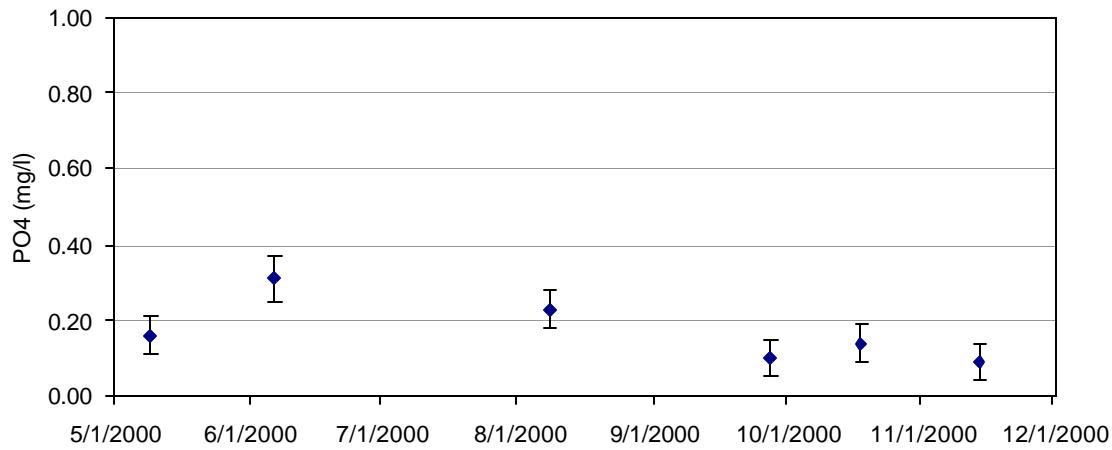


Figure O-17 Copco No. 1 Reservoir epilimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l]

Figure O-18 Copco No. 1 Reservoir epilimnion, BOD concentration, May – November 2000

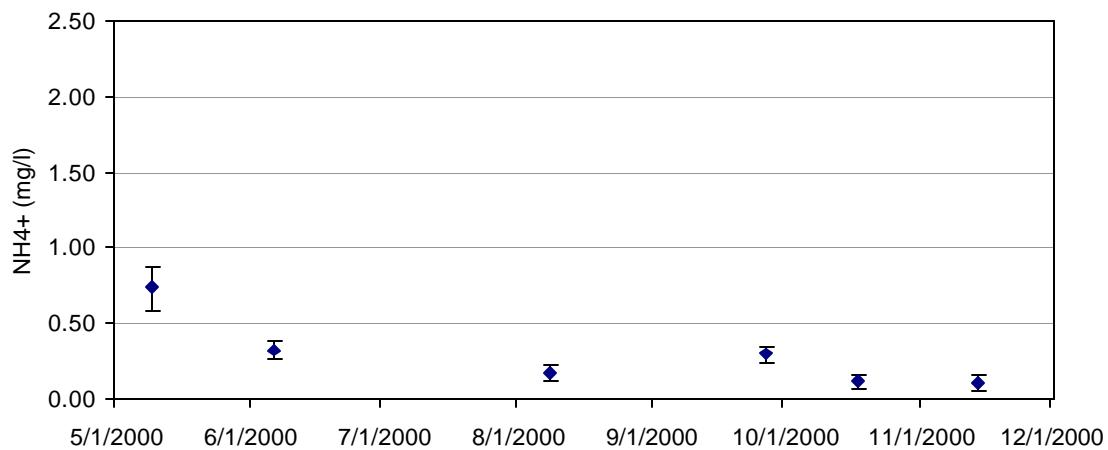


Figure O-19 Copco No. 1 Reservoir metalimnion, ammonia concentration, May – November 2000

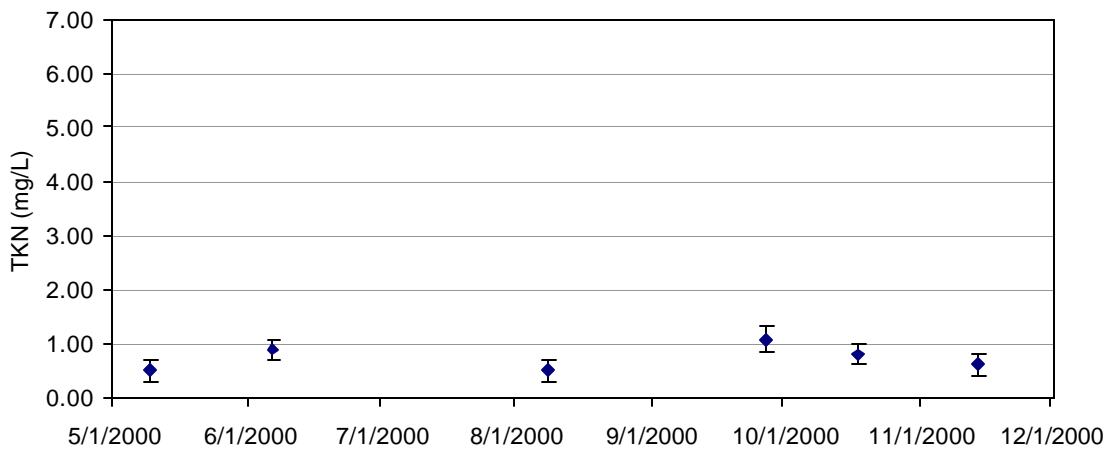


Figure O-20 Copco No. 1 Reservoir metalimnion, total Kjeldahl nitrogen concentration, May – November 2000

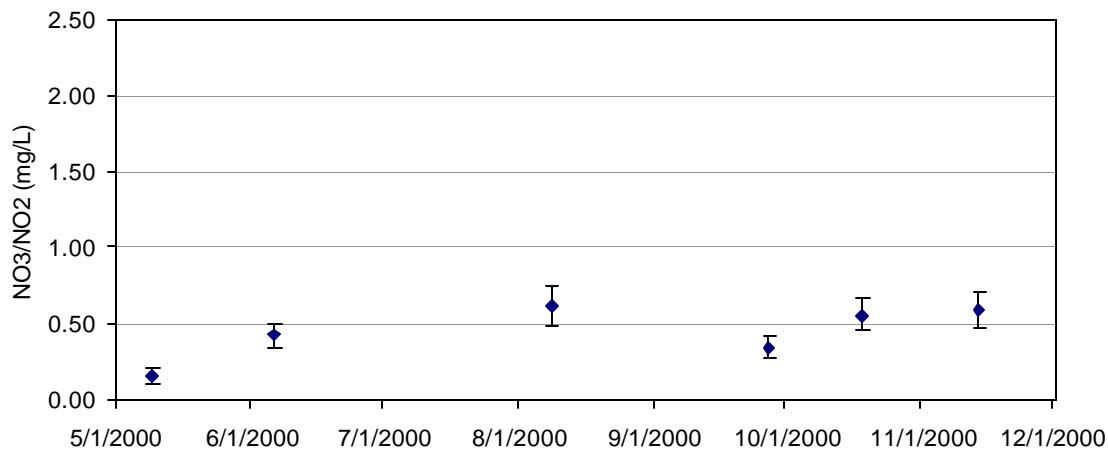


Figure O-21 Copco No. 1 Reservoir metalimnion, nitrite plus nitrate concentration, May – November 2000

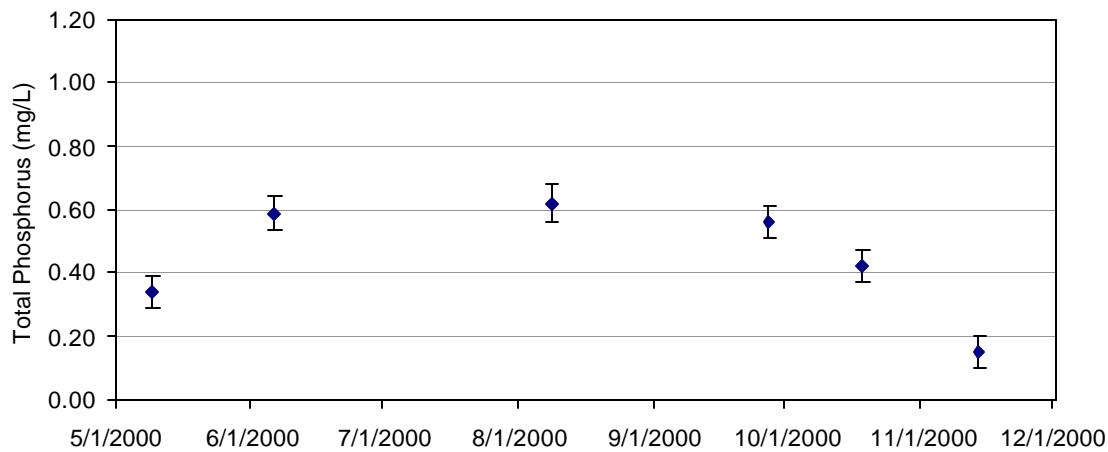


Figure O-22 Copco No. 1 Reservoir metalimnion, total phosphorous concentration, May – November 2000

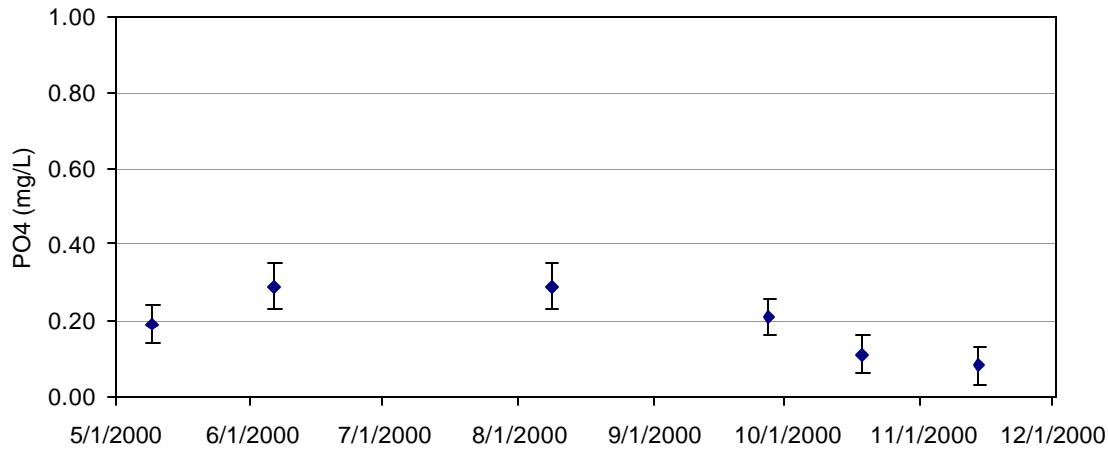


Figure O-23 Copco No. 1 Reservoir metalimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l]

Figure O-24 Copco No. 1 Reservoir metalimnion, BOD concentration, May – November 2000

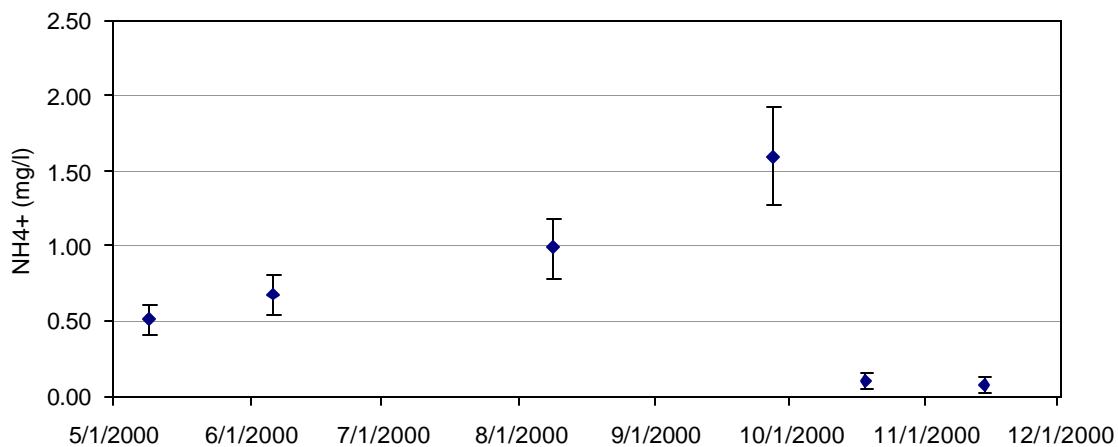


Figure O-25 Copco No. 1 Reservoir hypolimnion, ammonia concentration, May – November 2000

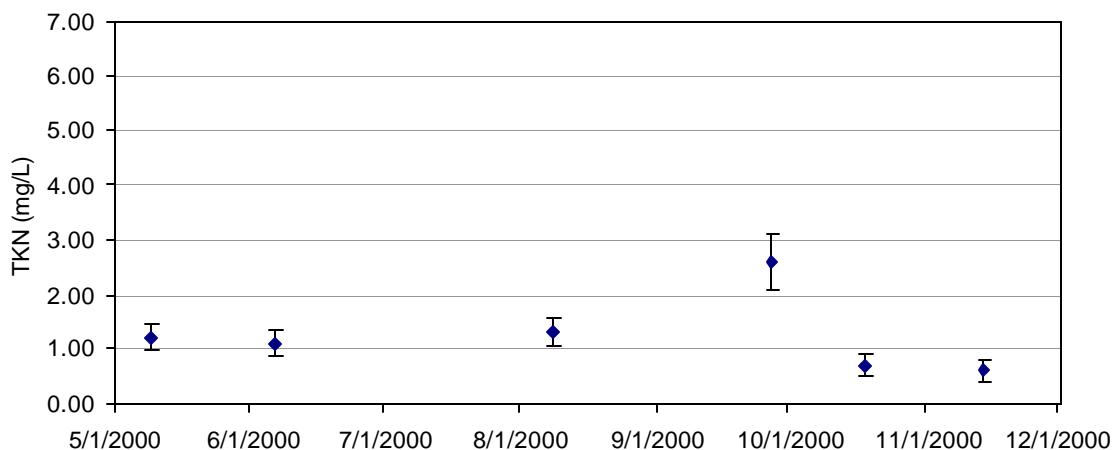


Figure O-26 Copco No. 1 Reservoir hypolimnion, total Kjeldahl nitrogen concentration, May – November 2000

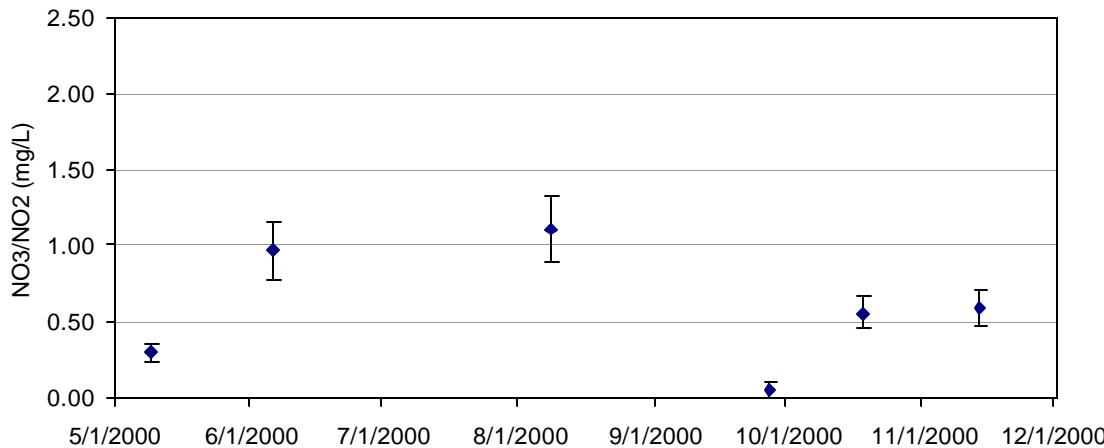


Figure O-27 Copco No. 1 Reservoir hypolimnion, nitrite plus nitrate concentration, May – November 2000

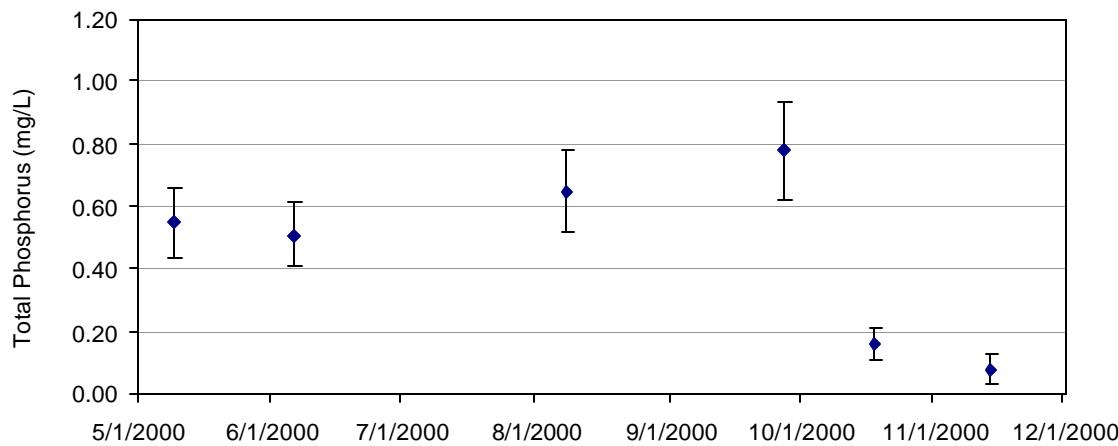


Figure O-28 Copco No. 1 Reservoir hypolimnion, total phosphorous concentration, May – November 2000

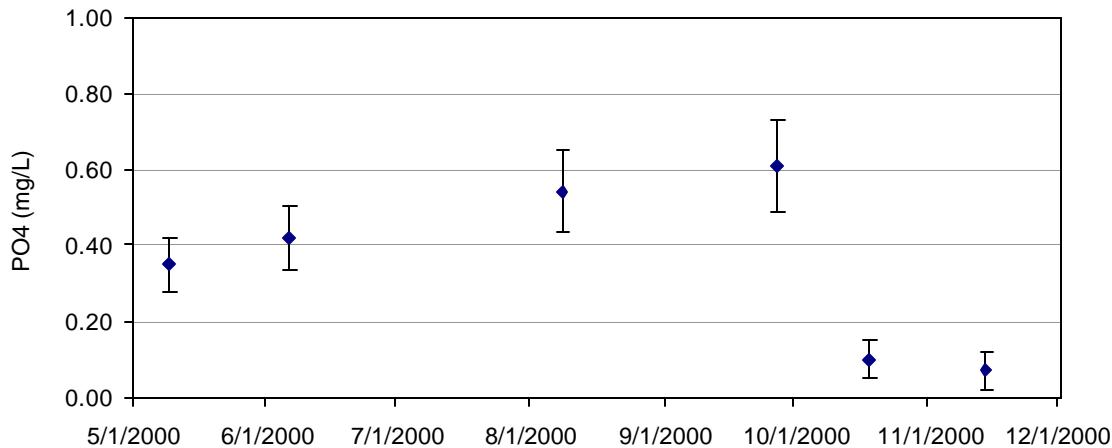


Figure O-29 Copco No. 1 Reservoir hypolimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l]

Figure O-30 Copco No. 1 Reservoir hypolimnion, BOD concentration, May – November 2000

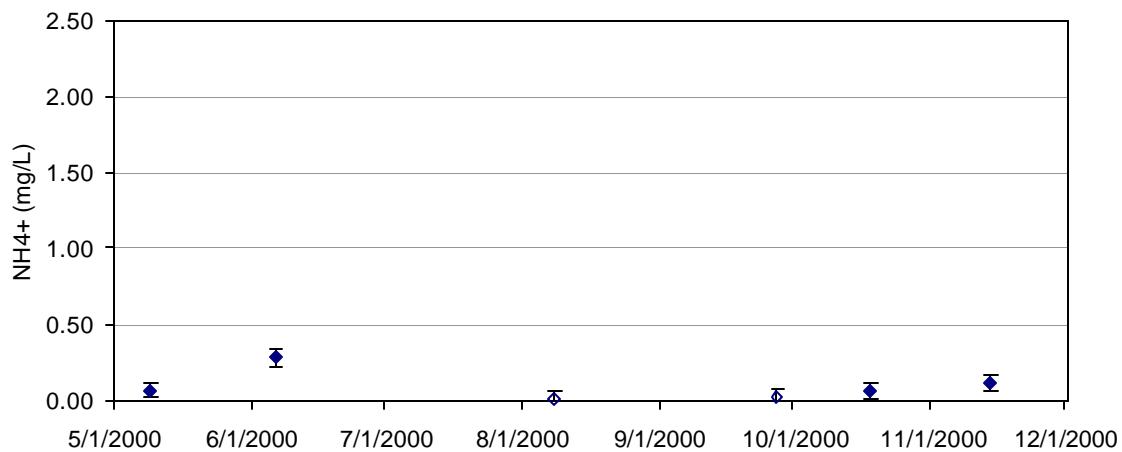


Figure O-31 Iron Gate Reservoir epilimnion, ammonia concentration, May – November 2000

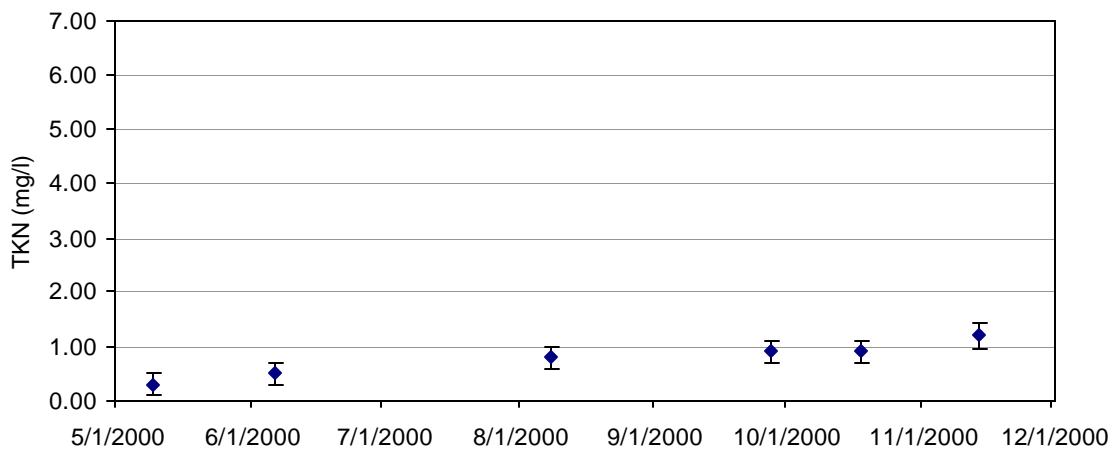


Figure O-32 Iron Gate Reservoir epilimnion, total Kjeldahl nitrogen concentration, May – November 2000

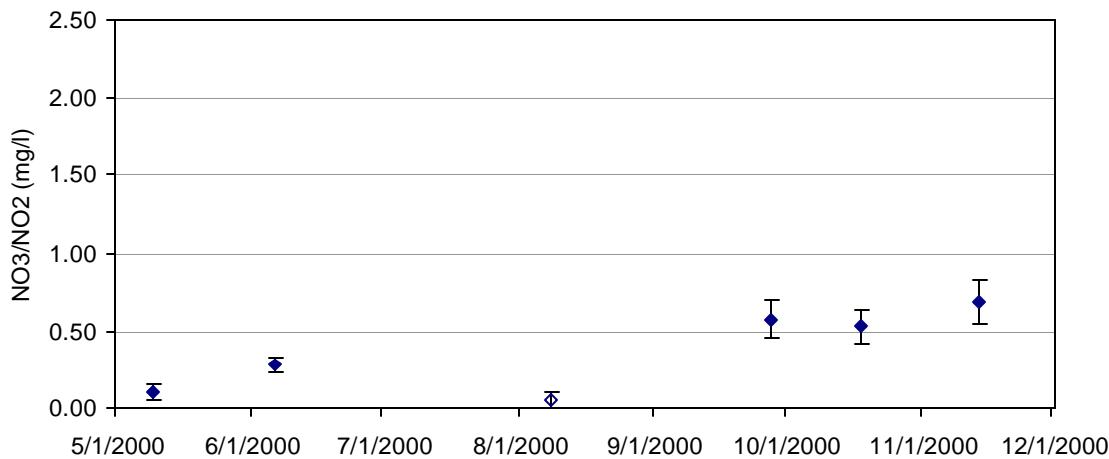


Figure O-33 Iron Gate Reservoir epilimnion, nitrite plus nitrate concentration, May – November 2000

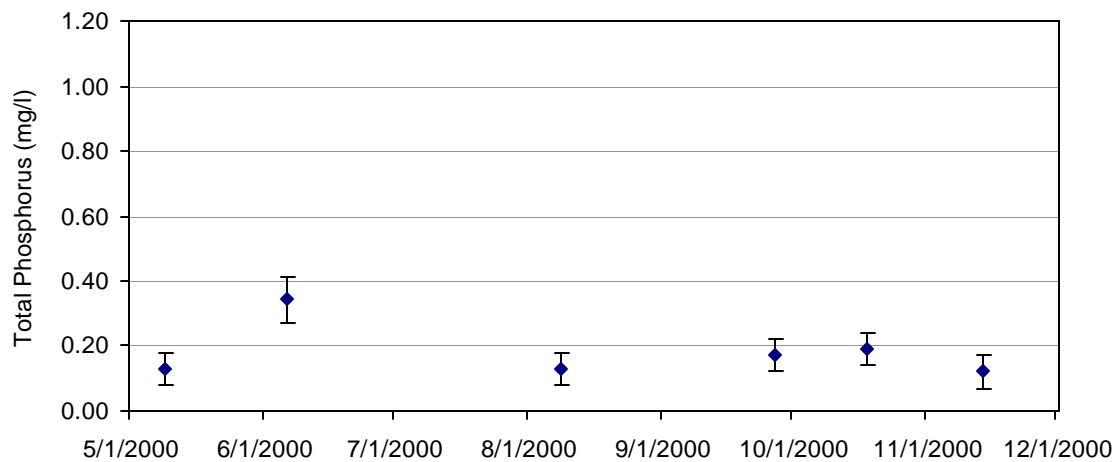


Figure O-34 Iron Gate Reservoir epilimnion, total phosphorous concentration, May – November 2000

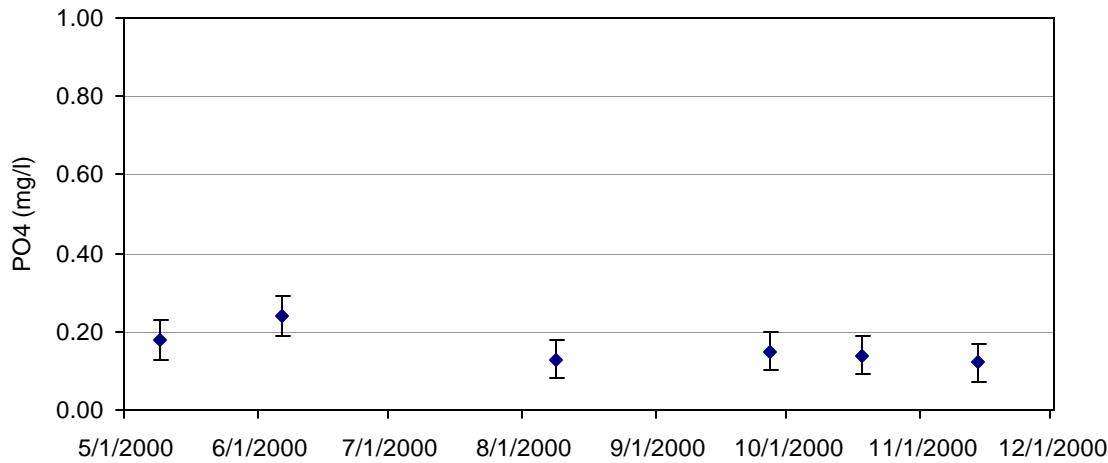


Figure O-35 Iron Gate Reservoir epilimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l. Exception is 5 mg/l on 8/8/00]

Figure O-36 Iron Gate Reservoir epilimnion, BOD concentration, May – November 2000

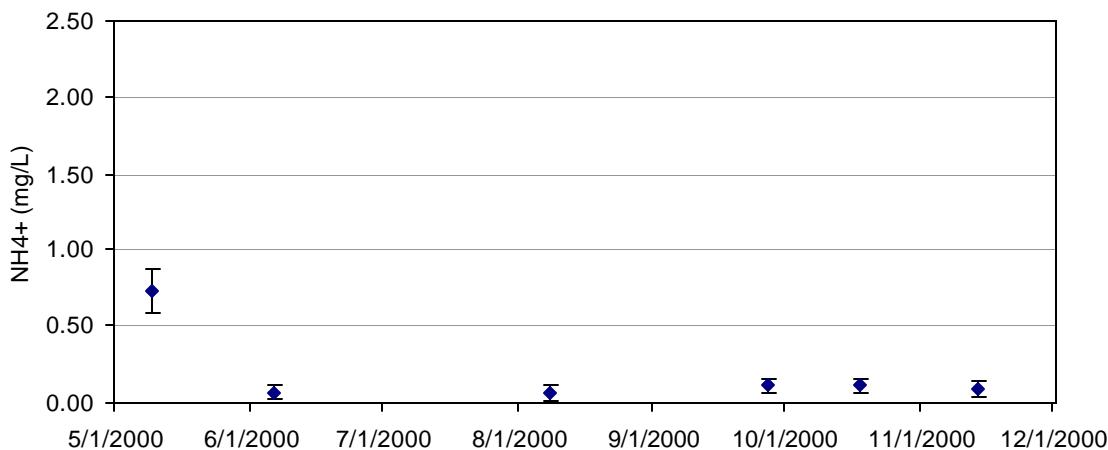


Figure O-37 Iron Gate Reservoir metalimnion, ammonia concentration, May – November 2000

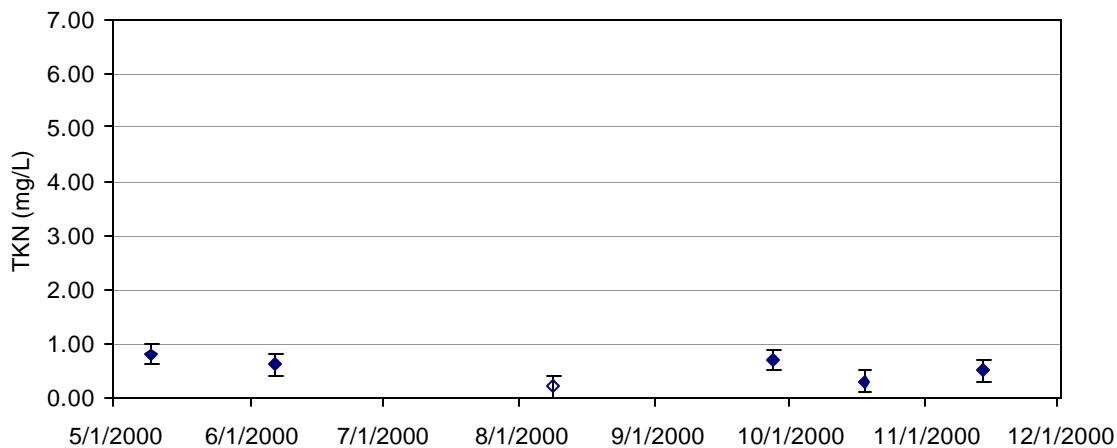


Figure O-38 Iron Gate Reservoir metalimnion, total Kjeldahl nitrogen concentration, May – November 2000

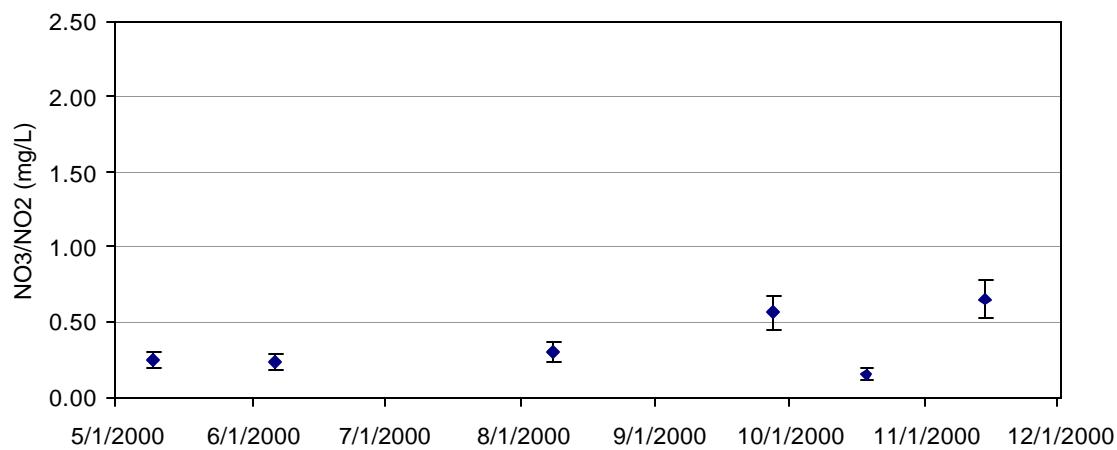


Figure O-39 Iron Gate Reservoir metalimnion, nitrite plus nitrate concentration, May – November 2000

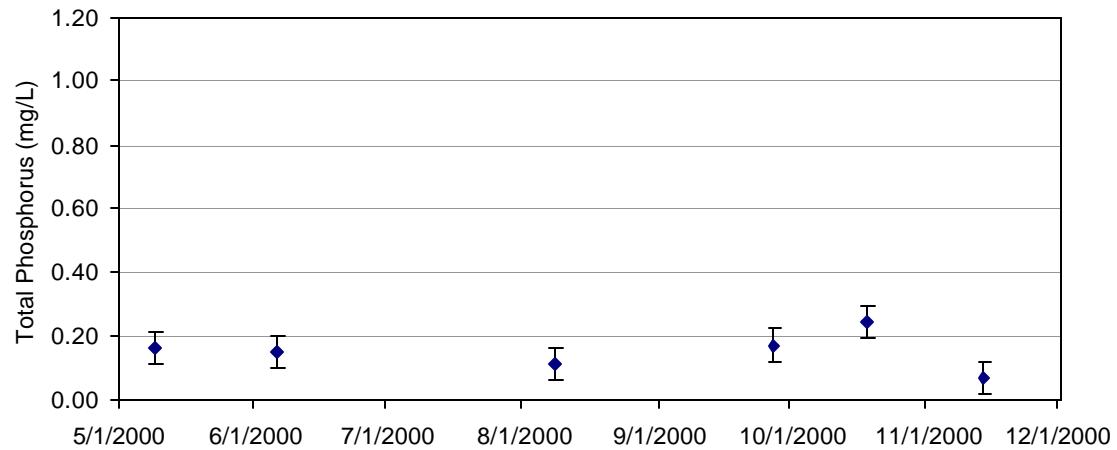


Figure O-40 Iron Gate Reservoir metalimnion, total phosphorous concentration, May – November 2000

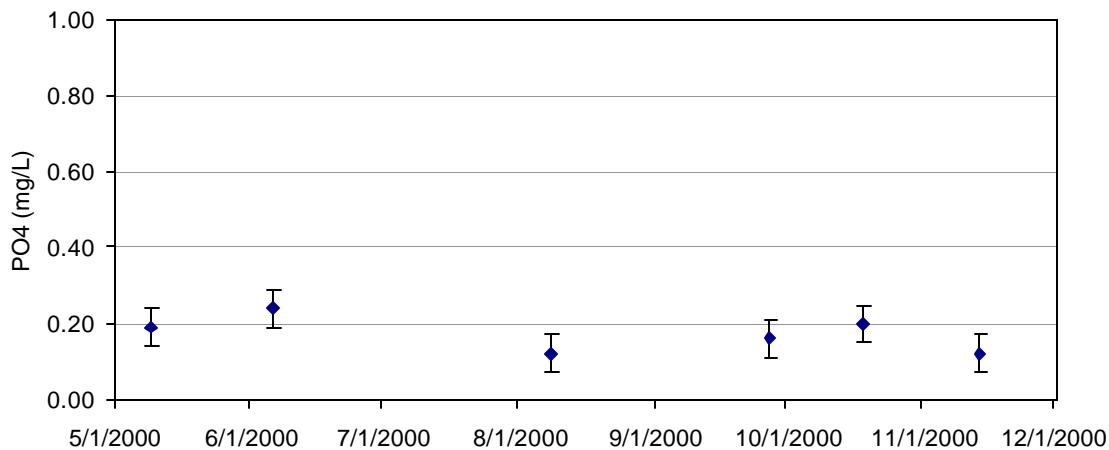


Figure O-41 Iron Gate Reservoir metalimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l.]

Figure O-42 Iron Gate Reservoir metalimnion, BOD concentration, May – November 2000

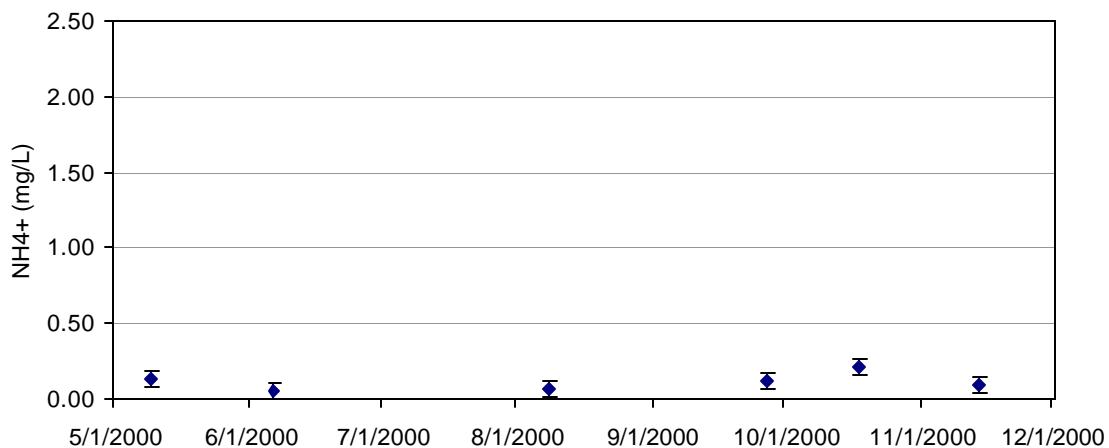


Figure O-43 Iron Gate Reservoir hypolimnion, ammonia concentration, May – November 2000

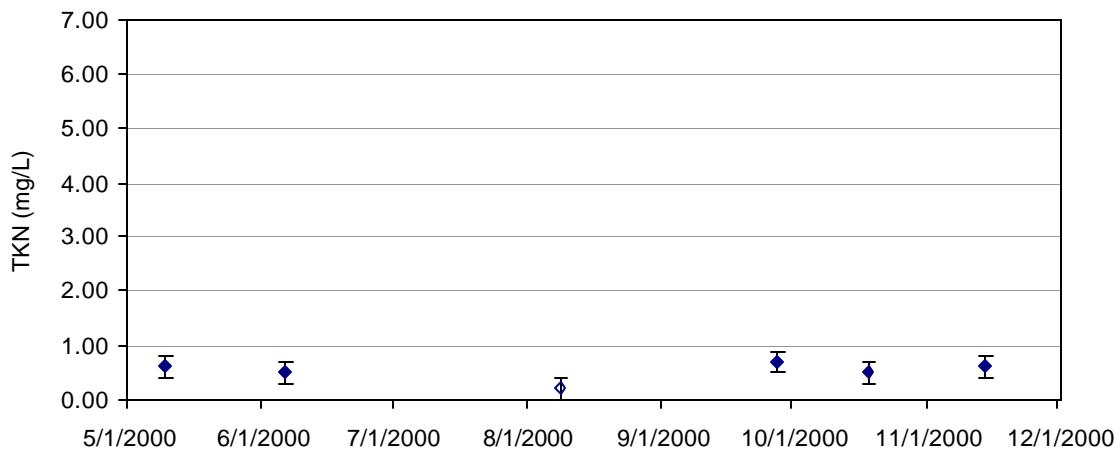


Figure O-44 Iron Gate Reservoir hypolimnion, total Kjeldahl nitrogen concentration, May – November 2000

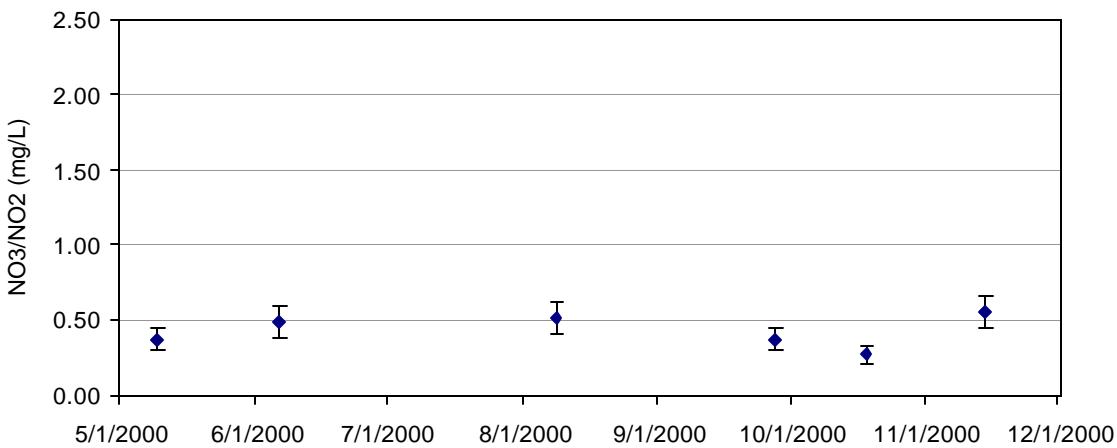


Figure O-45 Iron Gate Reservoir hypolimnion, nitrite plus nitrate concentration, May – November 2000

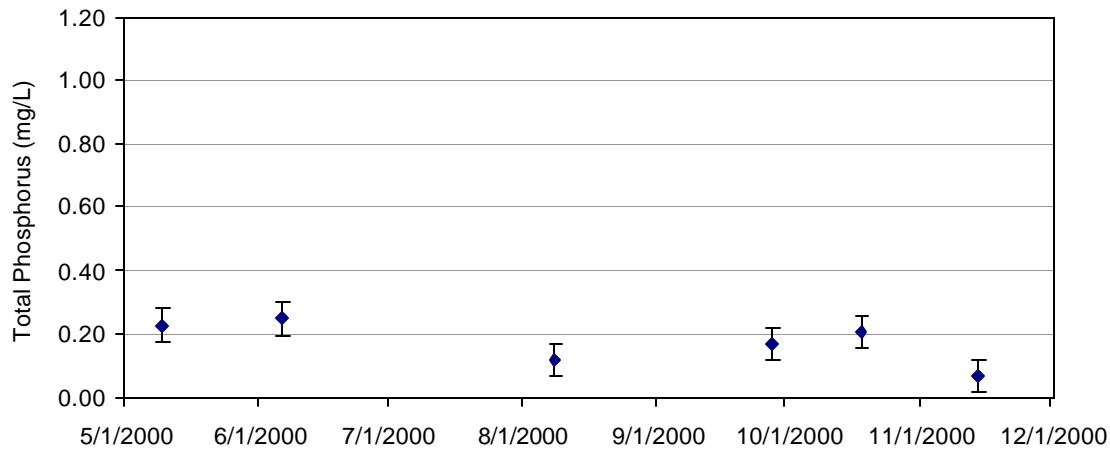


Figure O-46 Iron Gate Reservoir hypolimnion, total phosphorous concentration, May – November 2000

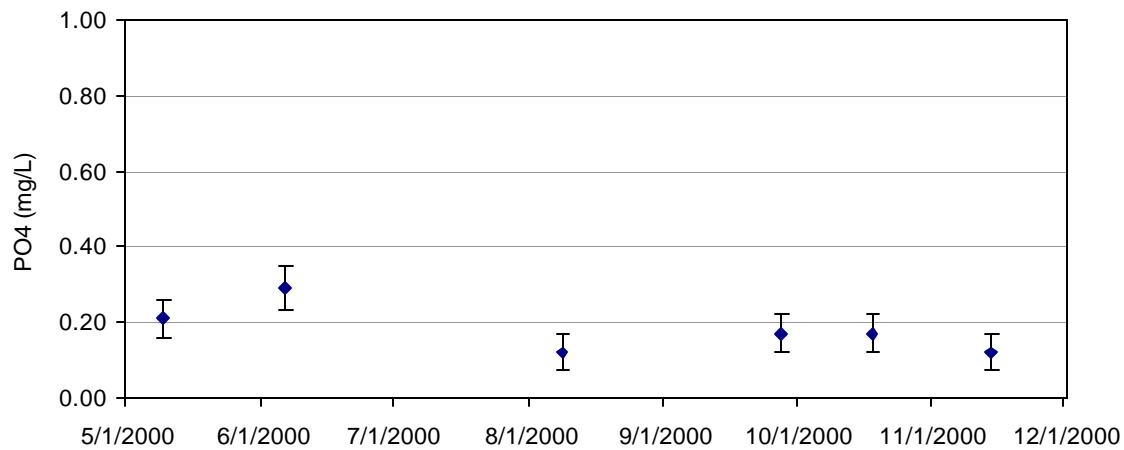


Figure O-47 Iron Gate Reservoir hypolimnion, orthophosphate concentration, May – November 2000

[All values at or below the reporting limit of 3.0 mg/l.]

Figure O-48 Iron Gate Reservoir hypolimnion, BOD concentration, May – November 2000

P RESERVOIR PROFILE DATA

Reservoir profile data were collected at approximately monthly intervals on mainstem reservoirs. Profile data consist of physical parameters measured with a water quality probe. The parameters include: water temperature, dissolved oxygen, electrical conductivity, and pH. Dissolved oxygen values presented are corrected for elevation differences among the various reservoirs. Secchi depth is also measured and is included in Table P-1. All data were supplied by PacifiCorp.

Table P-1 Secchi Depth for JC Boyle, Copco, and Iron Gate Reservoirs, May-November 2000

Date	JC Boyle	Copco	Iron Gate
		<i>Secchi Depth (ft)</i>	
5/9/00	3.25	5.50	6.00
6/6/00	3.50	5.50	6.00
8/8/00	5.00	6.50	5.50
9/27/00	2.70	4.00	14.00
10/18/00	3.50	4.50	6.50
11/14/00	4.00	-	-

Table P-2 Profile data for physical parameters at JC Boyle Reservoir: April - November

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
4/12/00	3.3	3788.9	14.4	146	7.3	8.5	8/8/00	1.6	3789.4	24.4	154	7.7	7.1
	6.6	3785.7	14.3	147	7.3	8.4		3.3	3787.7	24.4	154	7.7	7.0
	9.8	3782.4	14.3	147	7.3	8.4		6.6	3784.4	24.3	155	7.6	6.8
	13.1	3779.1	14.3	149	7.3	8.4		9.8	3781.2	23.7	155	7.4	4.6
	16.4	3775.8	14.3	149	7.3	8.5		13.1	3777.9	23.4	151	7.1	3.6
	19.7	3772.5	14.2	147	7.3	8.5		19.7	3771.3	23.0	154	7.0	3.2
	23.0	3769.3	14.2	156	7.3	8.6		26.2	3764.8	22.8	154	7.0	2.0
	26.2	3766.0	14.1	158	7.3	8.6		31.5	3759.5	22.8	166	6.9	1.9
5/9/00	0.7	3791.7	13.6	152	7.9	8.5	9/27/00	3.3	3788.8	15.5	261	8.5	7.6
	3.3	3789.1	13.6	151	7.9	8.4		6.6	3785.6	15.6	261	8.4	7.7
	6.6	3785.8	13.6	151	8.0	8.4		13.1	3779.0	15.6	261	8.4	7.1
	9.8	3782.5	13.7	150	8.0	8.4		19.7	3772.4	15.6	262	8.4	7.0
	13.1	3779.3	13.6	151	8.0	8.4		26.2	3765.9	15.6	262	8.4	6.8
	19.7	3772.7	13.4	145	7.9	8.1		29.5	3762.6	15.5	257	8.4	6.7
	26.2	3766.1	13.2	150	7.9	8.0		3.3	3789.8	10.6	157	7.5	10.6
	3.3	3788.9	19.3	251	8.8	8.6		6.6	3786.5	10.7	160	7.6	9.4
6/6/00	6.6	3785.6	19.3	249	8.7	8.3	10/18/00	9.8	3783.2	10.7	156	7.6	9.5
	9.8	3782.3	19.3	249	8.7	8.1		13.1	3780.0	10.7	164	7.6	9.7
	13.1	3779.0	19.2	257	8.6	7.5		16.4	3776.7	10.7	159	7.6	9.9
	16.4	3775.7	19.2	251	8.6	7.4		19.7	3773.4	10.7	159	7.6	10.6
	19.7	3772.5	19.2	255	8.6	7.4		23.0	3770.1	10.7	160	7.6	10.0
	23.0	3769.2	19.2	259	8.5	7.2		26.2	3766.8	10.7	160	7.6	10.2
	26.2	3765.9	19.0	258	8.4	6.9		29.5	3763.6	10.7	155	7.6	10.5
	29.5	3762.6	18.8	252	8.3	6.7		3.3	3788.7	3.9	156	7.7	9.3
7/11/00	1.6	3790.0	21.8	136	7.8	7.1	11/14/00	6.6	3785.4	3.9	161	7.7	9.2
	3.3	3788.4	21.0	134	7.7	6.9		9.8	3782.2	3.9	157	7.7	9.1
	6.6	3785.1	20.7	129	7.8	7.0		13.1	3778.9	3.9	155	7.6	9.0
	9.8	3781.8	20.1	126	7.6	6.7		16.4	3775.6	3.9	159	7.6	8.9
	13.1	3778.5	20.0	129	7.5	6.1		19.7	3772.3	3.9	159	7.6	8.9
	16.4	3775.2	19.0	135	7.3	5.3		26.2	3765.8	4.0	154	7.7	9.6
	19.7	3772.0	18.6	137	7.2	4.7							
	23.0	3768.7	18.3	137	7.2	4.3							

Table P-3 Profile data for physical parameters at Copco Reservoir: May - November

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
4/12/00	1.6	2603.0	15.3	151	8.4	11.6	5/9/00	0.0	2604.9	14.3	148	8.6	10.0
	3.3	2601.4	14.7	152	8.3	10.9		3.3	2601.6	14.3	148	8.6	9.8
	6.6	2598.1	14.3	152	8.1	10.5		6.6	2598.4	14.2	147	8.6	9.6
	9.8	2594.8	14.2	152	8.0	10.2		9.8	2595.1	14.0	151	8.5	9.4
	13.1	2591.5	14.1	151	8.0	10.3		13.1	2591.8	14.0	151	8.5	9.3
	16.4	2588.3	14.1	154	8.0	10.3		16.4	2588.5	13.9	149	8.4	9.1
	19.7	2585.0	14.1	151	8.0	10.4		19.7	2585.2	13.9	155	8.4	9.1
	23.0	2581.7	14.0	151	7.9	10.5		26.2	2578.7	13.7	151	8.2	8.6
	26.2	2578.4	13.4	159	7.8	10.0		32.8	2572.1	13.6	155	8.1	8.4
	29.5	2575.1	13.1	158	7.6	9.8		39.4	2565.6	13.3	147	8.0	7.9
	32.8	2571.9	12.4	162	7.5	9.3		45.9	2559.0	12.8	144	7.8	7.4
	39.4	2565.3	11.8	168	7.3	9.2		52.5	2552.4	12.6	148	7.7	7.1
	45.9	2558.7	11.2	171	7.3	9.1		59.1	2545.9	12.2	147	7.6	6.7
	52.5	2552.2	10.2	173	7.2	8.8		65.6	2539.3	11.6	147	7.5	5.5
	59.1	2545.6	9.9	171	7.1	8.4		72.2	2532.7	10.6	167	7.3	3.1
	65.6	2539.0	9.7	179	7.1	8.2		78.7	2526.2	10.2	162	7.2	2.0
	72.2	2532.5	9.3	179	7.0	7.9		85.3	2519.6	10.0	172	7.2	1.3
	78.7	2525.9	8.8	171	6.9	6.2		91.9	2513.1	9.9	175	7.2	0.9
	85.3	2519.4	8.8	174	6.9	6.0		98.4	2506.5	9.8	178	7.2	0.8
	91.9	2512.8	8.7	182	6.8	5.7							

Table P-3 Profile data for physical parameters at Copco Reservoir: May - November(continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
6/6/00	3.3	2600.5	19.2	245	8.9	10.5	8/8/00	3.3	2602.8	23.4	168	9.1	11.6
	6.6	2597.3	18.9	244	8.8	9.7		6.6	2599.5	23.1	167	9.1	11.9
	9.8	2594.0	18.9	244	8.8	9.6		9.8	2596.2	22.8	169	9.0	11.1
	13.1	2590.7	18.9	240	8.8	9.5		13.1	2592.9	22.7	169	8.9	10.1
	16.4	2587.4	18.8	242	8.7	9.1		19.7	2586.4	22.3	171	8.5	7.3
	19.7	2584.1	18.5	247	8.5	7.8		26.2	2579.8	21.9	169	8.0	5.9
	26.2	2577.6	17.9	245	8.3	7.4		32.8	2573.3	21.5	165	7.6	4.5
	32.8	2571.0	17.0	242	8.1	6.8		39.4	2566.7	20.6	176	7.3	31.2
	39.4	2564.5	15.9	221	7.9	6.3		45.9	2560.1	20.0	172	7.1	1.9
	45.9	2557.9	14.3	197	7.6	5.1		52.5	2553.6	18.5	168	7.0	0.5
	52.5	2551.3	13.2	189	7.5	4.8		59.1	2547.0	16.7	171	7.0	0.4
	59.1	2544.8	12.6	188	7.4	4.1		65.6	2540.4	15.2	196	7.0	0.3
	65.6	2538.2	12.4	176	7.3	3.8		72.2	2533.9	13.7	186	6.9	0.3
	72.2	2531.6	12.2	185	7.3	3.3		78.7	2527.3	13.2	185	6.9	0.3
	78.7	2525.1	11.9	195	7.2	2.0		85.3	2520.8	12.9	186	6.9	0.3
	85.3	2518.5	11.5	195	7.1	0.4		91.9	2514.2	12.8	180	6.8	0.3
	91.9	2512.0	11.5	197	7.1	0.3		98.4	2507.6	12.8	188	6.8	0.3
	98.4	2505.4	11.5	176	7.1	0.2							

Table P-3 Profile data for physical parameters at Copco Reservoir: May - November(Continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
7/11/00	1.6	2602.5	20.9	144	8.5	9.4	10/18/00	3.3	2600.9	13.6	201	7.7	10.5
	3.3	2600.9	20.6	143	8.4	8.8		6.6	2597.6	13.2	203	7.7	8.7
	6.6	2597.6	20.2	142	8.3	8.1		9.8	2594.3	13.2	203	7.7	8.6
	9.8	2594.3	20.1	144	8.2	7.6		13.1	2591.0	13.2	198	7.7	8.6
	13.1	2591.0	20.0	142	8.1	7.3		16.4	2587.7	13.2	198	7.7	8.7
	16.4	2587.8	20.0	143	8.1	7.4		19.7	2584.5	13.2	204	7.7	8.8
	19.7	2584.5	19.9	141	8.1	7.3		26.2	2577.9	13.2	203	7.7	9.0
	26.2	2577.9	19.1	150	7.5	4.6		32.8	2571.3	13.1	207	7.7	9.8
	32.8	2571.4	18.4	137	7.4	4.3		39.4	2564.8	12.7	184	7.7	9.8
	39.4	2564.8	18.2	140	7.4	4.4		45.9	2558.2	12.4	182	7.7	10.2
	45.9	2558.2	17.9	148	7.3	4.1		52.5	2551.6	12.2	179	7.8	11.0
	52.5	2551.7	16.4	166	7.1	0.3		59.1	2545.1	12.1	189	7.8	11.2
	59.1	2545.1	14.3	168	7.0	0.2		65.6	2538.5	12.0	164	7.9	11.6
	65.6	2538.6	13.3	176	7.0	0.2		72.2	2532.0	12.0	186	7.8	12.0
	72.2	2532.0	12.8	156	7.0	0.2		78.7	2525.4	11.9	173	7.9	12.3
	78.7	2525.4	12.6	169	6.9	0.2		85.3	2518.8	11.9	196	7.9	12.5
	85.3	2518.9	12.4	155	6.9	0.1		91.9	2512.3	11.8	165	7.9	12.8
	91.9	2512.3	12.3	148	6.9	0.1		98.4	2505.7	11.8	168	7.9	13.0
9/27/00	1.6	2600.0	18.5	193	9.0	8.8							
	3.3	2598.4	17.5	195	8.8	7.9							
	9.8	2591.8	17.3	196	8.6	7.2							
	16.4	2585.3	17.1	198	8.5	6.7							
	32.8	2568.9	16.7	202	8.3	5.2							
	49.2	2552.5	16.0	217	8.2	3.4							
	65.6	2536.1	15.5	220	8.2	3.9							
	82.0	2519.7	14.7	210	7.8	0.1							
	95.1	2506.5	14.5	211	7.8	0.0							

Table P-3 Profile data for physical parameters at Copco Reservoir: May - November(Continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
11/14/00	3.3	2597.9	8.26	140	8.9	8.7
	6.6	2594.6	8.26	141	8.5	8.5
	13.1	2588.1	8.27	140	8.2	0.1
	19.7	2581.5	8.28	140	8.1	0.1
	26.2	2575.0	8.22	141	8.0	0.1
	32.8	2568.4	7.84	143	7.9	0.1
	39.4	2561.8	7.83	143	7.9	0.1
	45.9	2555.3	7.69	144	7.9	0.2
	52.5	2548.7	7.36	145	7.8	0.2
	59.1	2542.2	7.30	145	7.8	0.2
	65.6	2535.6	7.25	146	7.8	0.4
	68.9	2532.3	7.19	146	7.8	0.5
	72.2	2529.0	7.16	146	7.8	0.9
	78.7	2522.5	7.13	146	7.8	2.0
	85.3	2515.9	7.13	146	7.8	4.9
	91.9	2509.3	7.12	146	7.8	6.9
	98.4	2502.8	7.25	189	7.5	4.2

Table P-4 Profile data for physical parameters at Iron Gate Reservoir: May - November

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
4/12/00	0.3	2327.9	14.7	166	8.7	11.8	5/9/00	1.6	2327.3	14.3	146	8.4	9.3
	3.3	2325.0	14.7	165	8.7	12.5		3.3	2325.7	14.3	147	8.4	9.3
	6.6	2321.7	14.4	166	8.7	12.8		6.6	2322.4	13.7	147	8.3	9.1
	9.8	2318.4	13.5	165	8.3	11.8		9.8	2319.1	13.8	150	8.3	9.0
	13.1	2315.1	13.2	165	8.0	11.2		13.1	2315.8	13.3	144	8.1	8.5
	16.4	2311.8	12.8	166	7.8	10.8		16.4	2312.5	13.2	150	8.0	8.4
	19.7	2308.6	12.2	167	7.5	10.2		19.7	2309.3	12.9	147	8.0	8.2
	23.0	2305.3	12.1	165	7.5	10.1		26.2	2302.7	12.4	156	7.9	8.0
	26.2	2302.0	12.1	167	7.5	10.1		32.8	2296.1	12.1	158	7.8	7.9
	29.5	2298.7	11.8	168	7.5	10.0		39.4	2289.6	11.7	151	7.7	7.5
	32.8	2295.4	11.7	166	7.4	10.0		45.9	2283.0	11.3	140	7.6	7.1
	39.4	2288.9	9.7	167	7.3	10.0		52.5	2276.4	10.8	161	7.6	6.8
	45.9	2282.3	9.2	168	7.3	10.0		59.1	2269.9	10.4	170	7.5	6.6
	52.5	2275.7	8.6	172	7.2	10.0		65.6	2263.3	9.1	168	7.5	6.5
	59.1	2269.2	8.0	171	7.2	10.0		72.2	2256.8	7.8	157	7.4	6.4
	65.6	2262.6	7.3	171	7.1	10.0		78.7	2250.2	6.9	170	7.4	6.3
	72.2	2256.1	6.9	170	7.1	10.0		85.3	2243.6	6.6	176	7.4	6.2
	78.7	2249.5	6.7	171	7.1	10.1		91.9	2237.1	6.4	183	7.3	6.0
	85.3	2242.9	6.5	159	7.1	10.1		98.4	2230.5	6.8	171	7.4	6.2
	91.9	2236.4	6.4	165	7.1	10.1		105.0	2224.0	6.2	182	7.3	6.1
	98.4	2229.8	6.4	163	7.1	10.1		111.5	2217.4	6.1	150	7.3	5.9
	105.0	2223.3	6.3	167	7.1	10.0		118.1	2210.8	6.1	164	7.4	5.6
	111.5	2216.7	6.2	161	7.1	10.0		124.7	2204.3	6.0	166	7.2	5.2
	118.1	2210.1	6.2	160	7.1	10.1		131.2	2197.7	6.0	153	7.2	4.9
	124.7	2203.6	6.2	163	7.1	10.0		137.8	2191.1	6.0	163	7.2	3.9
	131.2	2197.0	6.2	165	7.0	9.6		144.4	2184.6	6.0	150	7.2	2.9
	137.8	2190.4	6.2	176	7.0	9.3							
	144.4	2183.9	6.1	173	6.9	8.4							

Table P-4 Profile data for physical parameters at Iron Gate Reservoir: May - November (Continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
6/6/00	3.3	2322.1	19.7	225	8.8	10.5	7/11/00	3.3	2323.0	22.3	157	8.6	8.8
	6.6	2318.8	19.1	223	8.8	10.1		6.6	2319.7	22.2	157	8.6	8.8
	9.8	2315.5	18.9	224	8.7	9.7		9.8	2316.5	22.2	157	8.6	8.7
	13.1	2312.2	18.8	226	8.7	9.5		13.1	2313.2	21.6	155	8.3	7.6
	16.4	2308.9	17.7	216	8.4	8.4		16.4	2309.9	20.0	160	7.5	4.6
	19.7	2305.7	17.2	220	8.2	7.8		19.7	2306.6	19.7	153	7.4	4.6
	26.2	2299.1	16.6	218	8.0	7.2		26.2	2300.1	19.5	156	7.4	4.4
	32.8	2292.5	15.8	205	7.9	6.7		32.8	2293.5	19.1	149	7.4	4.3
	39.4	2286.0	14.1	189	7.8	6.4		39.4	2286.9	18.8	166	7.3	3.5
	45.9	2279.4	12.9	169	7.6	6.5		45.9	2280.4	17.6	186	7.3	3.6
	52.5	2272.8	11.8	172	7.5	6.0		52.5	2273.8	15.9	178	7.3	3.5
	59.1	2266.3	10.9	175	7.4	5.7		59.1	2267.2	14.4	159	7.2	3.6
	65.6	2259.7	8.9	181	7.3	5.4		65.6	2260.7	12.7	140	7.1	4.0
	72.2	2253.2	7.3	173	7.3	5.0		72.2	2254.1	10.7	146	7.1	3.5
	78.7	2246.6	6.8	174	7.2	4.9		78.7	2247.6	8.8	140	6.9	2.6
	85.3	2240.0	6.5	176	7.2	4.9		85.3	2241.0	7.5	139	7.0	2.9
	91.9	2233.5	6.5	179	7.2	4.8		91.9	2234.4	7.0	154	6.9	2.4
	98.4	2226.9	6.4	172	7.1	4.6		98.4	2227.9	6.8	145	6.8	1.5
	105.0	2220.4	6.4	167	7.2	4.3		105.0	2221.3	6.7	156	6.8	1.0
	111.5	2213.8	6.3	163	7.1	4.2		111.5	2214.8	6.7	148	6.8	0.5
	118.1	2207.2	6.2	166	7.1	4.0		118.1	2208.2	6.6	139	6.8	1.1
	124.7	2200.7	6.2	193	7.2	3.4		124.7	2201.6	6.5	146	6.8	0.2
	131.2	2194.1	6.2	162	7.1	2.2		131.2	2195.1	6.5	142	6.7	0.3
	137.8	2187.5	6.1	159	7.0	1.1		137.1	2189.2	6.5	147	6.7	0.2
	144.4	2181.0	6.1	183	6.9	0.3							

Table P-4 Profile data for physical parameters at Iron Gate Reservoir: May - November (Continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
8/8/00	3.3	2323.2	25.3	162	9.5	14.1	9/27/00	3.3	2320.8	18.4	176	7.6	6.4
	6.6	2319.9	24.6	162	9.4	13.1		6.6	2317.5	17.8	171	7.6	6.1
	9.8	2316.6	24.1	164	9.2	10.6		9.8	2314.2	17.4	170	7.5	5.7
	13.1	2313.3	22.0	170	7.9	4.9		13.1	2310.9	17.3	172	7.5	5.4
	19.7	2306.8	21.5	168	7.7	4.2		19.7	2304.4	17.3	171	7.4	5.2
	26.2	2300.2	21.3	164	7.5	3.3		26.2	2297.8	17.2	170	7.4	4.9
	32.8	2293.7	20.6	158	7.3	3.0		32.8	2291.3	17.0	179	7.3	3.5
	39.4	2287.1	20.0	171	7.2	2.7		39.4	2284.7	16.8	179	7.2	3.3
	45.9	2280.5	18.6	187	7.1	1.9		45.9	2278.1	16.7	184	7.3	4.0
	52.5	2274.0	16.4	207	7.1	2.1		52.5	2271.6	16.5	185	7.3	4.1
	59.1	2267.4	13.5	189	7.1	2.8		59.1	2265.0	16.3	191	7.2	3.2
	65.6	2260.8	11.7	156	7.0	2.5		65.6	2258.4	16.1	190	7.1	1.0
	72.2	2254.3	10.1	168	6.9	1.9		72.2	2251.9	14.1	170	7.0	0.3
	78.7	2247.7	8.4	165	6.9	1.4		78.7	2245.3	10.5	173	6.9	0.3
	85.3	2241.2	7.8	174	6.8	1.0		85.3	2238.8	9.5	175	6.9	0.3
	91.9	2234.6	7.3	146	6.8	0.8		91.9	2232.2	8.2	190	6.9	0.3
	98.4	2228.0	7.1	157	6.7	0.4		98.4	2225.6	7.7	192	6.9	0.3
	105.0	2221.5	7.0	156	6.7	0.4		105.0	2219.1	7.5	191	6.9	0.3
	111.5	2214.9	6.9	174	6.7	0.3		121.4	2202.7	7.2	190	7.0	0.3
	118.1	2208.4	6.8	156	6.7	0.3		137.8	2186.3	7.1	190	6.9	0.3
	124.7	2201.8	6.8	159	6.7	0.3							
	131.2	2195.2	6.7	170	6.6	0.3							
	137.8	2188.7	6.7	131	6.7	0.3							
	144.4	2182.1	6.6	178	6.6	0.3							

Table P-4 Profile data for physical parameters at Iron Gate Reservoir: May - November (Continued)

Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)	Date	Depth (ft)	Elevation (ft msl)	Tw (C)	EC (uS/cm)	pH	DO (mg/l)
10/18/00	3.3	2320.8	14.9	210	7.5	6.5	11/14/00	3.3	2322.8	9.84	155	7.7	6.6
	6.6	2317.5	14.8	208	7.5	5.4		6.6	2319.5	9.82	155	7.7	6.5
	9.8	2314.3	14.7	209	7.5	5.4		13.1	2312.9	9.82	155	7.7	6.5
	13.1	2311.0	14.7	210	7.5	5.4		19.7	2306.4	9.82	155	7.6	5.7
	16.4	2307.7	14.6	203	7.5	5.4		26.2	2299.8	9.82	154	7.6	1.9
	19.7	2304.4	14.6	207	7.5	5.4		32.8	2293.2	9.81	155	7.6	1.0
	26.2	2297.9	14.6	211	7.5	5.4		39.4	2286.7	9.80	156	7.6	0.9
	32.8	2291.3	14.5	208	7.5	5.3		45.9	2280.1	9.77	154	7.6	1.1
	39.4	2284.7	14.3	207	7.5	5.3		52.5	2273.5	9.65	152	7.6	1.5
	45.9	2278.2	14.2	212	7.5	4.9		59.1	2267.0	9.46	150	7.6	2.3
	52.5	2271.6	14.0	210	7.5	5.2		65.6	2260.4	9.42	150	7.6	4.7
	59.1	2265.0	13.9	203	7.6	5.4		72.2	2253.9	9.32	151	7.5	4.8
	65.6	2258.5	13.9	215	7.6	5.4		78.7	2247.3	9.31	149	7.6	6.7
	72.2	2251.9	13.8	198	7.6	5.2		85.3	2240.7	9.26	151	7.6	6.9
	78.7	2245.4	13.5	200	7.5	3.8		91.9	2234.2	9.23	150	7.6	6.8
	85.3	2238.8	9.9	191	7.3	2.6		98.4	2227.6	9.16	150	7.6	6.8
	91.9	2232.2	8.6	168	7.1	2.2		105.0	2221.1	9.10	151	7.5	6.1
	98.4	2225.7	8.0	194	7.1	1.7		111.5	2214.5	9.00	153	7.5	5.6
	105.0	2219.1	7.6	186	7.1	1.7		118.1	2207.9	8.07	163	7.4	1.0
	111.5	2212.6	7.4	212	7.1	1.5							
	118.1	2206.0	7.3	195	7.1	1.0							
	124.7	2199.4	7.3	184	7.1	0.5							
	131.2	2192.9	7.2	175	7.0	0.4							

Q RESERVOIR THERMISTOR STRINGS

Temperature logging thermistors were deployed at multiple depths in JC Boyle, Copco and Iron Gate Reservoir. The devices were attached at fixed intervals to a cable and suspended from the cable or log boom in each reservoir. For JC Boyle, the thermistor spacing was 5 feet, for Copco and Iron Gate Reservoirs the spacing was 10 feet. Temperature was monitored at one-hour intervals. The data are too numerous to reproduce in complete tabular or graphical form, but selected time series at selected depths are plotted and briefly discussed below. It is notable that the long term deployments, collecting sub-daily data, provided significantly more insight into system dynamics than the monthly temperature profiles. All data are included in the electronic files.

Q.1 Iron Gate Reservoir

Remote logging thermistors (Onset Computer Corporation model TBI32-05+37) were deployed on May 10, 2000 and removed April 10, 2001. Devices were suspended on a braided wire cable from the log boom at the surface, 5 feet deep, and at 10 foot intervals from 10 feet to 120 feet of depth. Plotted in Figure Q.1 are the time series from selected depths (surface, 20, 40, 60, 80, and 100 feet). Several processes and conditions are readily apparent from these detailed data sets, and are outlined in the table below corresponding to figure labels. Thorough investigation of reservoir profiles based on these thermal records has not been completed. This presentation is intended to provide only a cursory description of potential field processes.

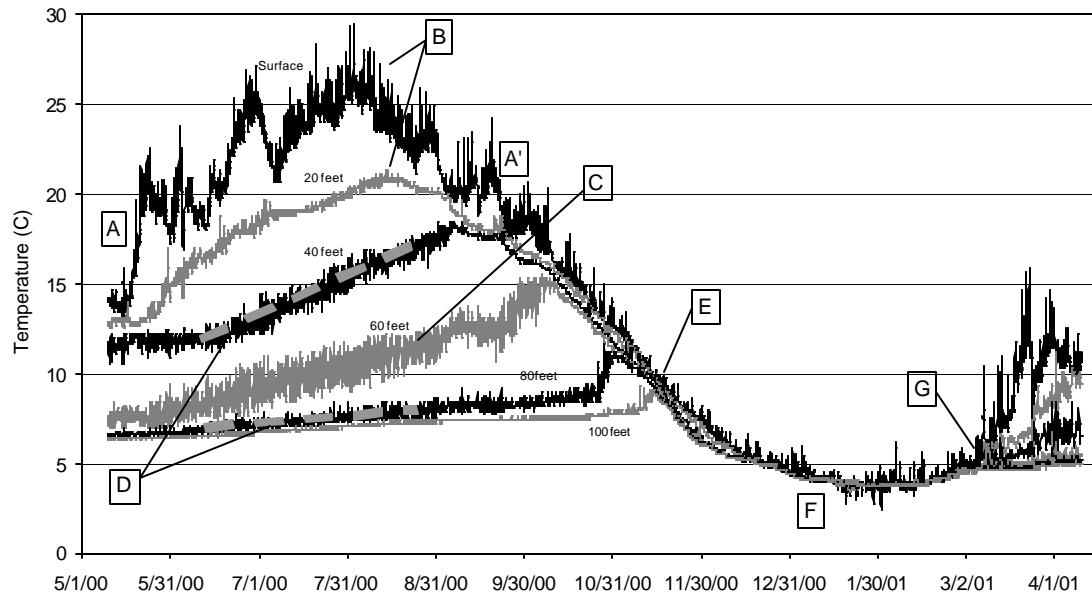


Figure Q-1 Iron Gate Reservoir measured hourly water temperature at the surface and 20, 40, 60, 80, and 100 foot depths, May 2000 - April 2001

Table Q-1 Iron Gate Reservoir summary of short term (sub-daily) to long -term (seasonal) thermal response

Label	Description
A, A'	Surface waters are prone to appreciable rates of heating (A) and cooling (A'), responding quickly to atmospheric conditions. Maximum surface water temperatures approach 30°C.
B	Surface waters are generally prone to larger diurnal variations in response to atmospheric conditions than deeper reservoir waters, but exceptions occur (see "C" below).
C	Significant diurnal variation occurs in the temperature trace at the 60 foot depth, especially when compared with the signal at the 20 foot depth. Deas and Orlob (1999) identified that this phenomenon is probably associated with daily peaking power production releases from Copco Reservoir. A close inspection of the data illustrate that these data typically have more than one maxima and minima per day.
D	Heating rates at various depths are readily discernable from the data series in response to mixing processes and thermal stratification within the reservoir. For example temperatures at the 40 foot depth increase at a rate of roughly 2°C per month, while those at the 100 foot depth increase at a rate of roughly 0.5°C per month (as approximated by grey dashed lines). The data further indicate that at the deepest depths the reservoir is heating well into November, prior to turnover.
E	Fall cooling through the process of convective cooling and a deepening of the thermocline is apparent as the temperature traces of the deeper time series intersect the descending limb of the surface and near-surface water temperature traces. Fall turnover is complete (isothermal conditions) around the third week of November.
F	During the middle of winter, the entire reservoir experiences cold water temperatures – in the neighborhood of 4°C. This water is the source of water for the upcoming summer cold water supply. It is interesting to note that the coldest temperatures at this time of year (about 3°C) occur in the surface waters as the point of maximum density occurs at just under 4°C.
G	The onset of thermal stratification occurs in the first week of March 2000 when surface and near surface temperatures deviate markedly from bottom waters.

Q.2 Copco Reservoir

Remote logging thermistors (Onset Computer Corporation model TBI32-05+37) were deployed on May 10, 2000 and removed April 10, 2001. Devices were suspended on a braided wire cable from the log boom at the surface, 5 feet deep, and at 10 foot intervals from 10 feet to 120 feet of depth. Plotted in Figure Q.2 are the time series from selected depths (surface, 20, 40, 60, and 80 feet). Several processes and conditions are readily apparent from these detailed data sets, and are outlined below corresponding to labels on the figure

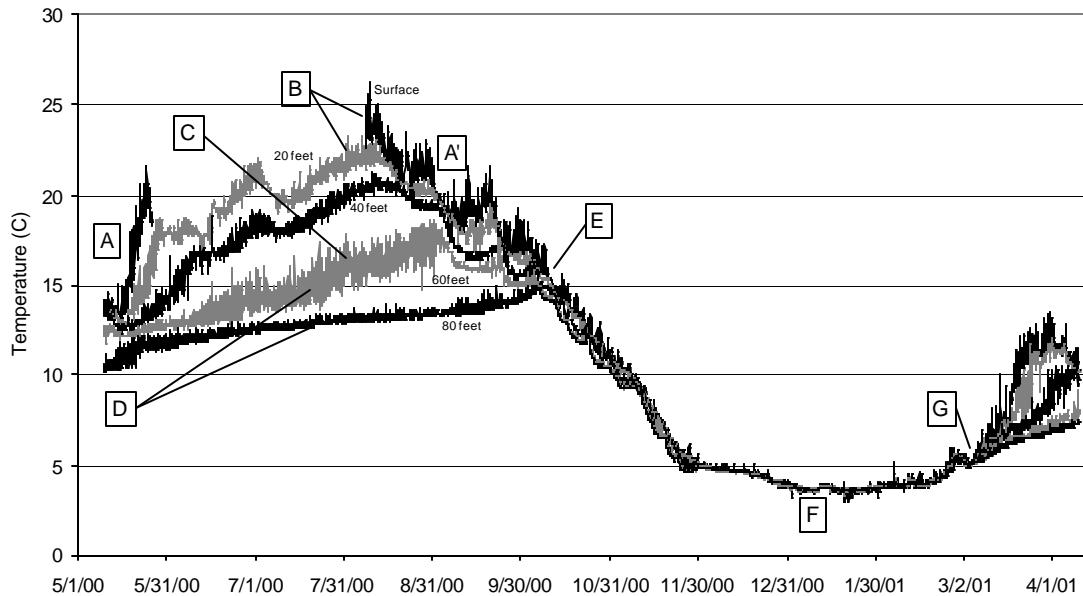


Figure Q-2 Copco Reservoir measured hourly water temperature at the surface and 20, 40, 60, and 80 foot depths in, May 2000 - April 2001

Table Q-2 Copco Reservoir summary of short term (sub-daily) to long-term (seasonal) thermal response

Label	Description
A, A'	Surface waters are prone to appreciable rates of heating (A) and cooling (A'), responding quickly to atmospheric conditions. Because a portion of the Copco surface temperature record is missing, it is unclear if Copco or Iron Gate Reservoir experiences higher surface water temperatures.
B	Surface waters are generally prone to larger diurnal variations in response to atmospheric conditions than deeper reservoir waters, but exceptions occur (see "C" below).
C	Significant diurnal variation occurs in the temperature trace at the 60 foot depth, especially when compared with the signal at the 20 foot depth. This phenomenon is probably associated with daily peaking power production releases from JC Boyle Reservoir.
D	As with Iron Gate Reservoir, heating rates at various depths within Copco Reservoir are readily discernable from the data series in response to mixing processes and thermal stratification within the reservoir, with deeper waters heating at a slower rate than shallower waters. The data further indicate that at the deepest depths the reservoir is heating through September, prior to turnover.
E	Fall cooling through the process of convective cooling and a deepening of the thermocline is apparent as the temperature traces of the deeper time series intersect the descending limb of the surface and near-surface water temperature traces. Fall turnover is complete (isothermal conditions) around the first week of October – some six to seven weeks prior to Iron Gate Reservoir. Review of temperature data from the Klamath River upstream of Copco Reservoir illustrate that the river cools much quicker than the reservoir in the fall period. Cooler influent waters (both long term and diurnally) coupled with mixing energy of waters of lower density probably lead to the early turnover of Copco Reservoir when compared with Iron Gate Reservoir. Iron Gate Reservoir does not experience such cool water inputs because the thermal mass of Copco takes appreciable time to cool – when fall turnover occurs in Copco the reservoir reaches an isothermal condition at about 15°C, well above the cooler bottom waters of Iron Gate Reservoir. Compared to Iron Gate Reservoir, the smaller and less complex morphology, and shallower conditions at Copco may further lend itself to early turnover.

- F During the middle of winter, the entire reservoir experiences cold water temperatures – in the neighborhood of 4°C. This water is the source of water for the upcoming summer cold water supply.
- G The onset of thermal stratification occurs in the first week of March 2000 when surface and near surface temperatures deviate markedly from bottom waters. Iron Gate Reservoir onset of stratification occurs at the same time, indicating that meteorological conditions are superseding flow conditions. This may not be the case in all years.

Q.3 JC Boyle Reservoir

Remote logging thermistors (Onset Computer Corporation model TBI32-05+37) were deployed on May 10, 2000 and removed November 14, 2000. Devices were suspended on a braided wire cable from the log boom at the surface and at 5 foot intervals from the surface to 25 feet of depth. Plotted in Figure Q.3 are the time series from selected depths (surface, 10, and 20feet). Several processes and conditions are readily apparent from these detailed data sets, and are outlined below corresponding to labels on the figure

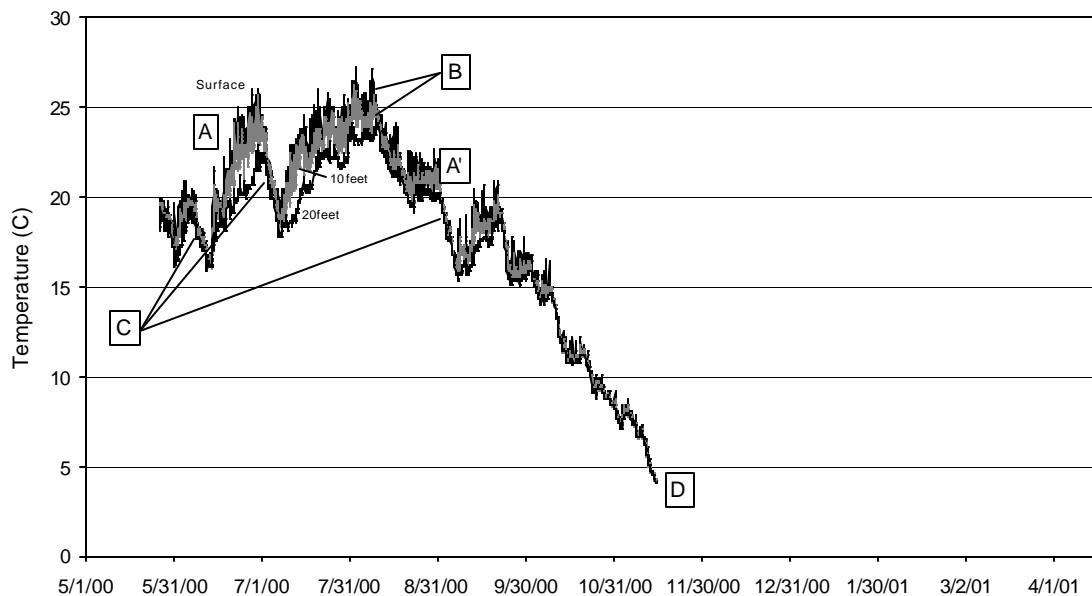


Figure Q-3 JC Boyle Reservoir measured hourly water temperature at the surface, 10 and 20foot depths, May 2000 - November 2000

Table Q-3 JC Boyle Reservoir summary of short term (sub-daily) to long -term (seasonal) thermal response

Label	Description
A, A'	Surface waters are prone to appreciable rates of heating (A) and cooling (A'), responding quickly to atmospheric conditions. Maximum surface water temperatures are in excess of 27°C.
B	Surface waters are generally prone to larger diurnal variations in response to atmospheric conditions than deeper reservoir waters.
C	Intermittent destratification in systems that is typically weakly stratified.
D	JC Boyle Reservoir, with a small volume and short residence time response more akin to a river than a reservoir when thermal loading is small in the late fall months. Note that JC Boyle Reservoir is isothermal at close to 4°C by 11/14/00 (as compared to Copco and Iron Gate Reservoirs which are both nearly isothermal by mid-November at about 8-9°C).

R RIVER AND RESERVOIR FLOW DATA

All sampling dates shown as vertical dashed lines. Flow data below the Iron Gate Dam station was unavailable after 9/30/00.

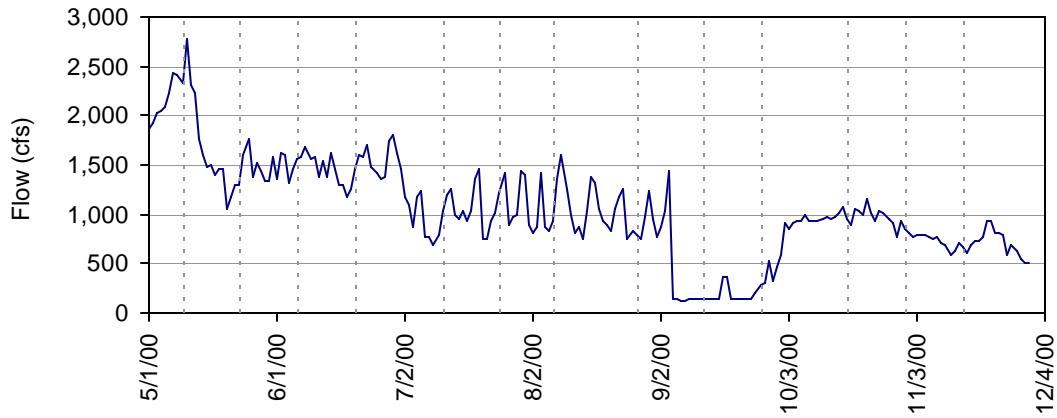


Figure R-1 Klamath River below Link Dam, daily

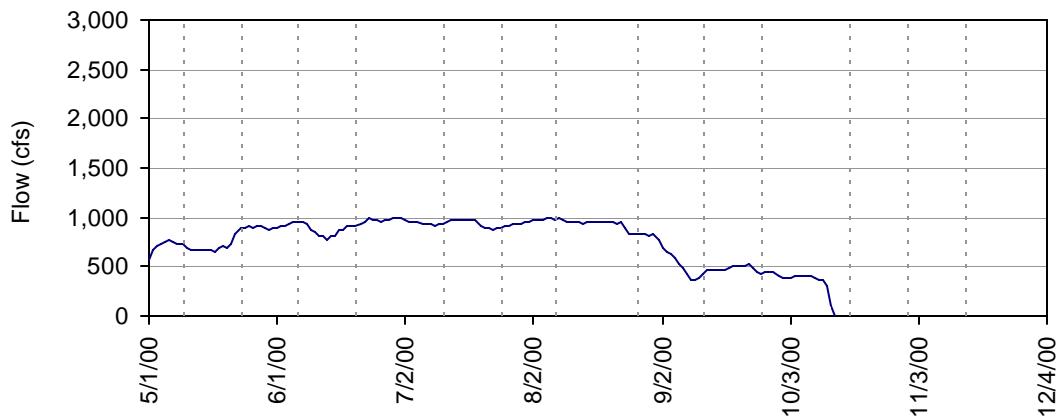


Figure R-2 A-Canal, daily

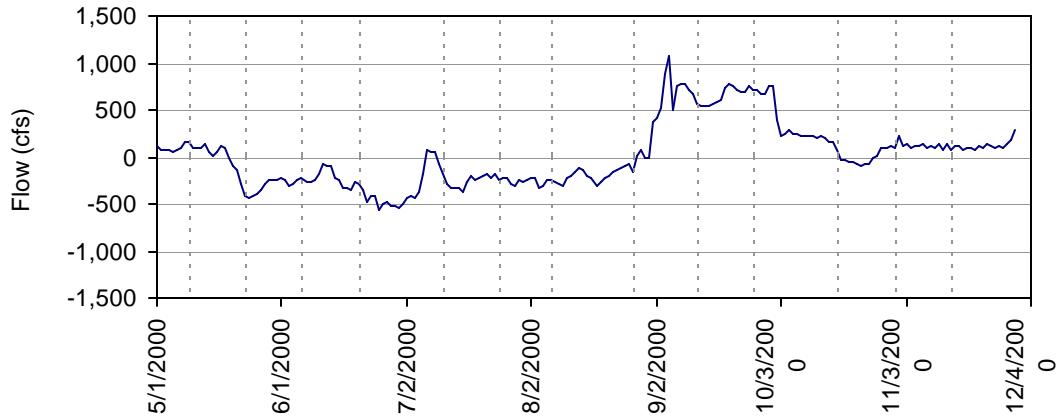


Figure R-3 Lost River Diversion Canal to Klamath River, daily

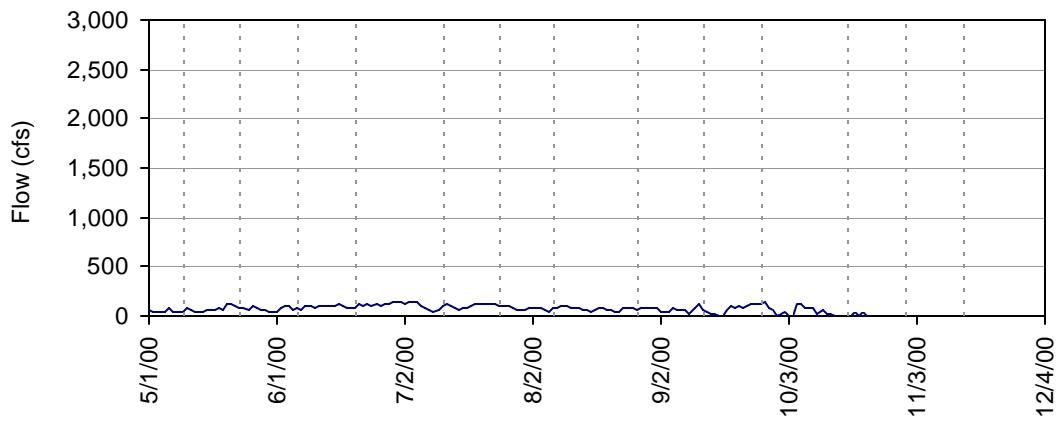


Figure R-4 North Canal, daily

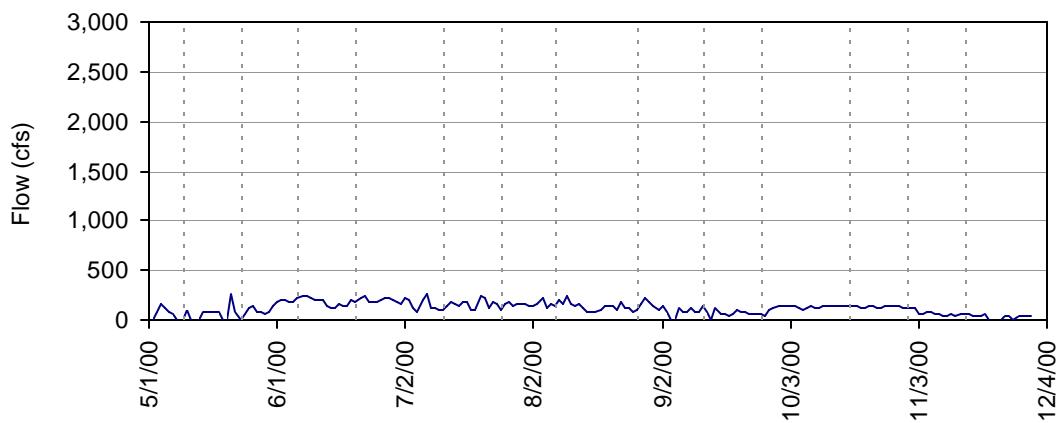


Figure R-5 ADY Canal, daily

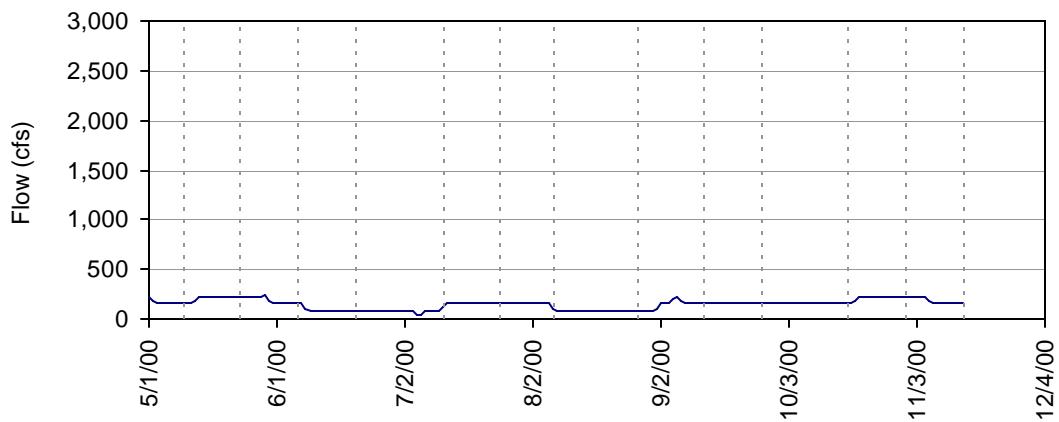


Figure R-6 Klamath Straits Drain – P Canal, daily

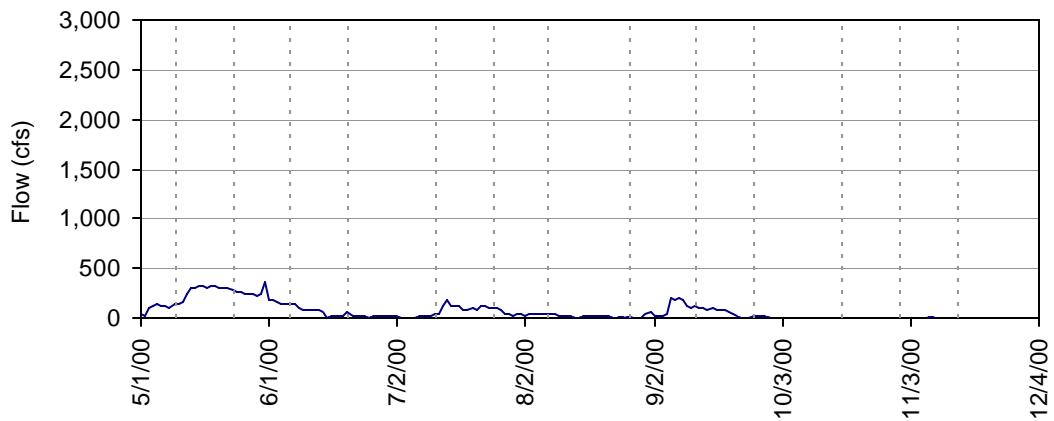


Figure R-7 Klamath Straits Drain at State Line, daily

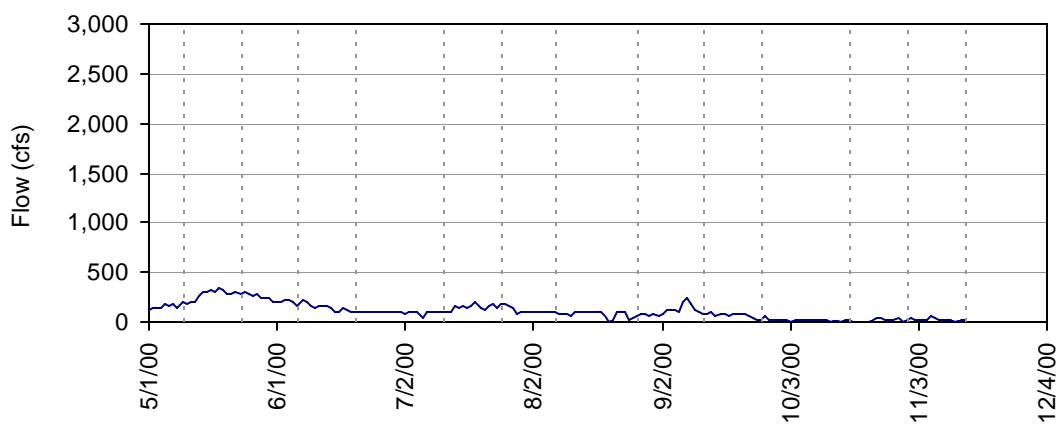


Figure R-8 Klamath Straits Drain at Highway 97, daily

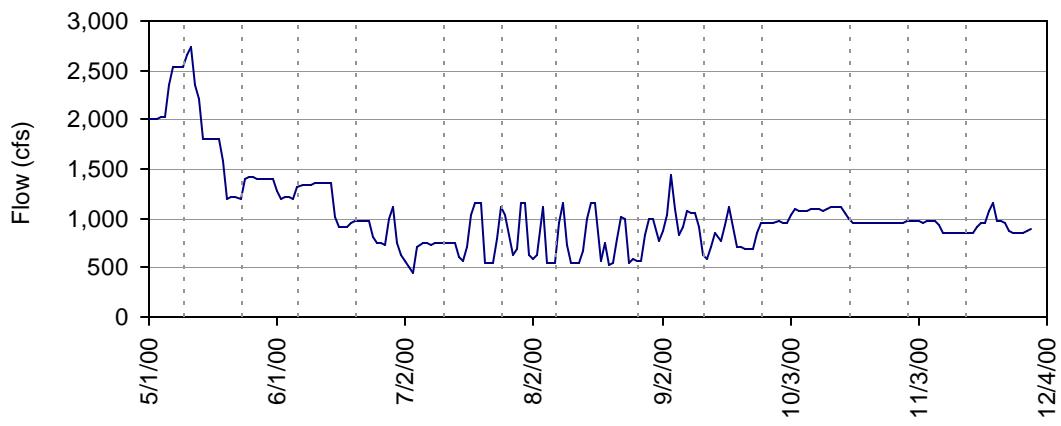


Figure R-9 Klamath River at Keno, daily

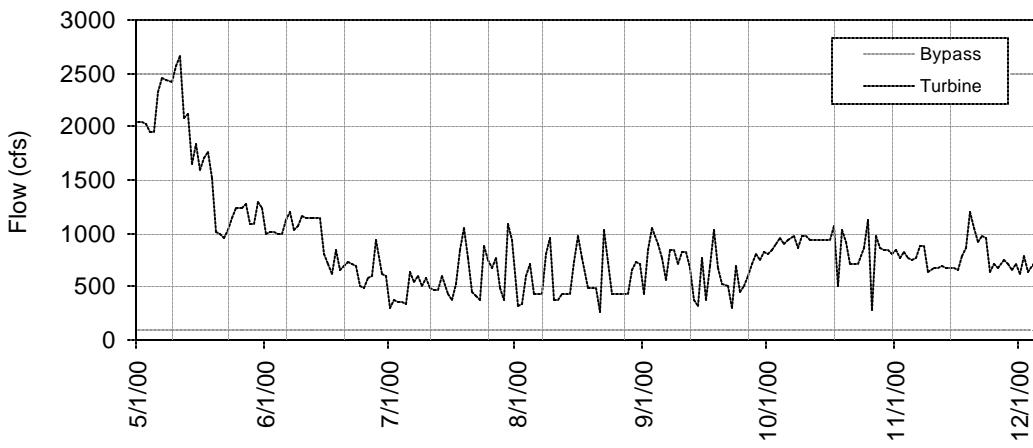


Figure R-10 JC Boyle Reservoir release, daily

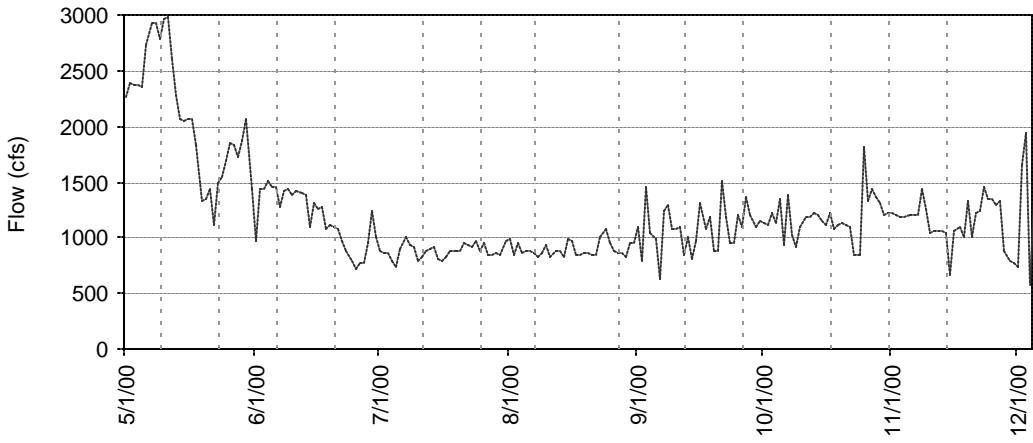


Figure R-11 Copco No. 1 Reservoir release, daily

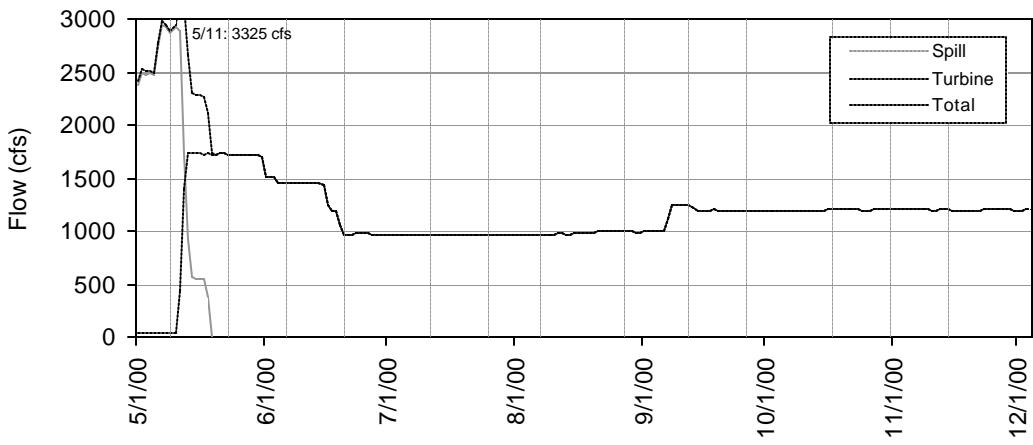


Figure R-12 Klamath River below Iron Gate Dam, daily

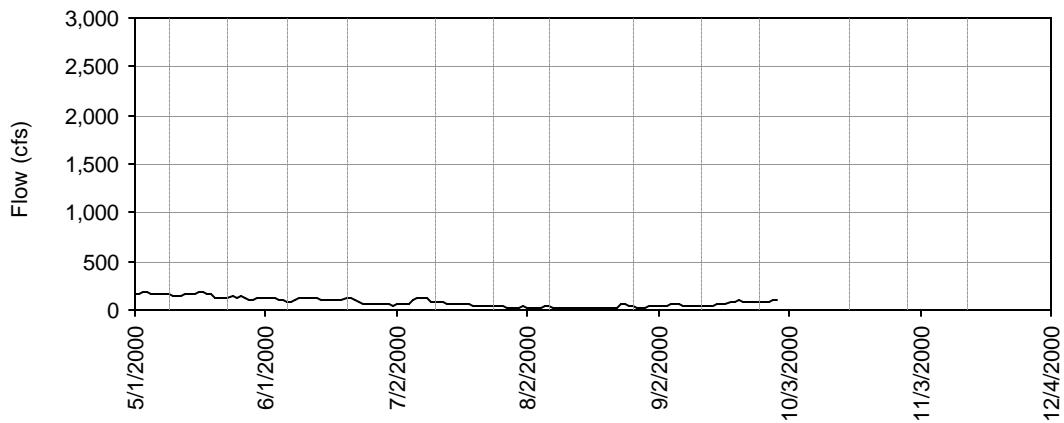


Figure R-13 Shasta River near Yreka, daily

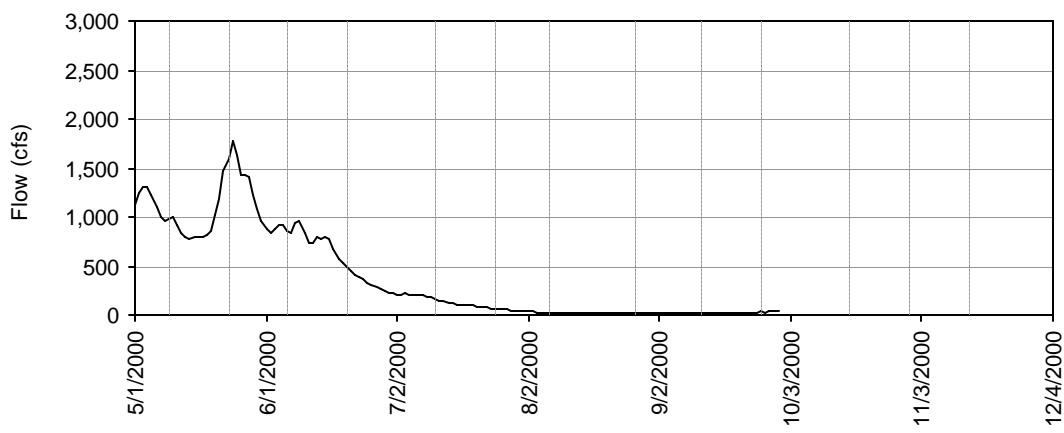


Figure R-14 Scott River near Ft. Jones, daily

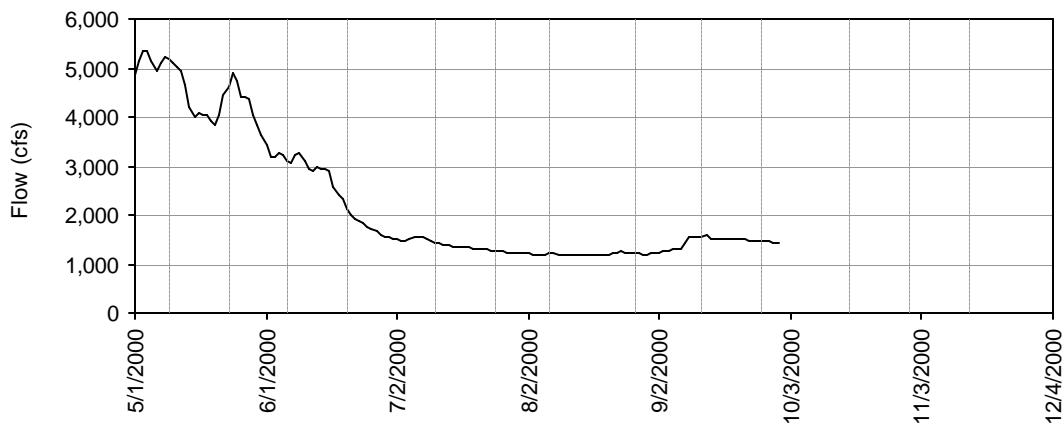


Figure R-15 Klamath River near Seiad Valley, daily

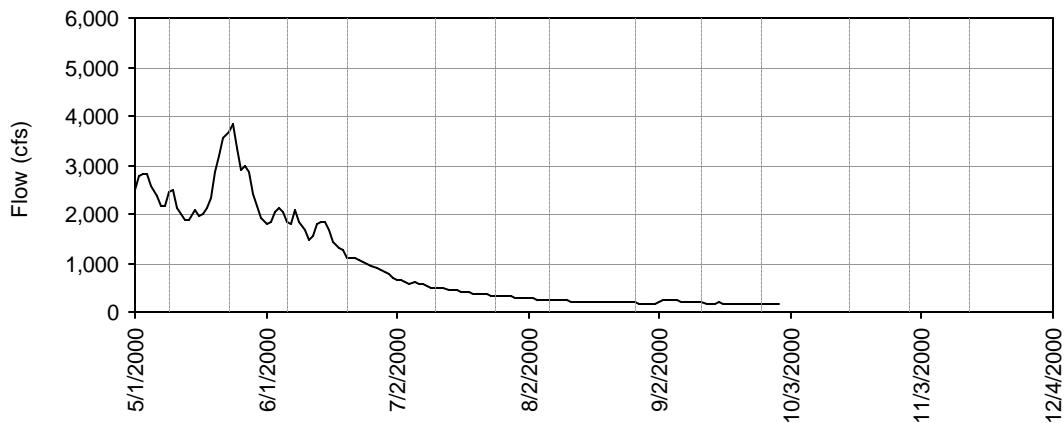


Figure R-16 Salmon River at Somes Bar, daily

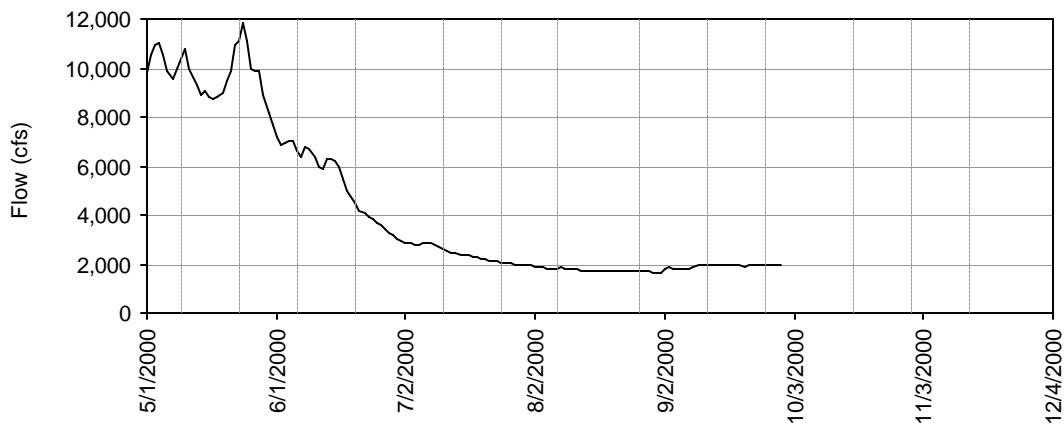


Figure R-17 Klamath River at Orleans, daily

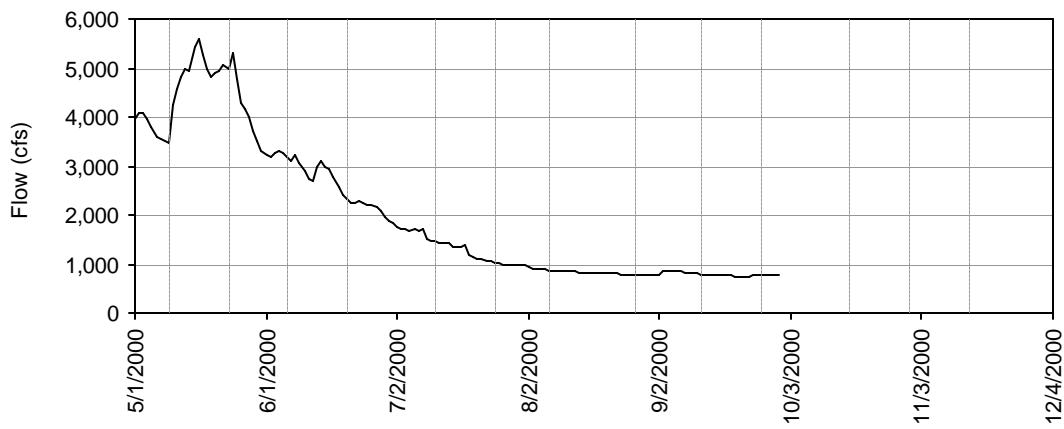


Figure R-18 Trinity River at Hoopa, daily

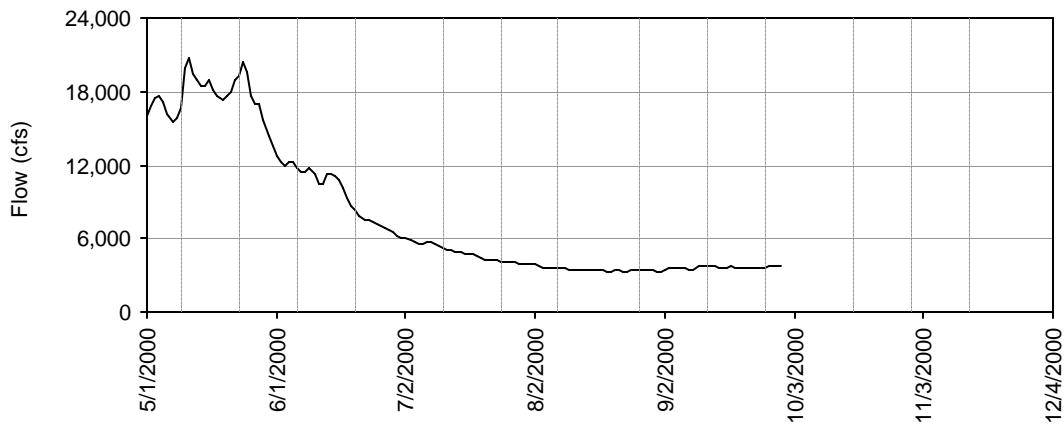


Figure R-19 Klamath River near Turwar Creek, daily

S RESERVOIR STAGE AND VOLUME DATA

Reservoir storage is “total” versus “active.” Total storage is the entire volume of the reservoir, while active storage refers the storage that is actively managed for day-to-day operations. Total maximum storage at JC Boyle is 3495 acre-feet, at Copco No. 1 is 45,500 acre-feet, and at Iron Gate Reservoir is 58,794 acre-feet. Active maximum storage at JC Boyle is 1724 acre-feet, at Copco No. 1 is 6235 acre-feet, and at Iron Gate Reservoir is 3790 acre-feet.

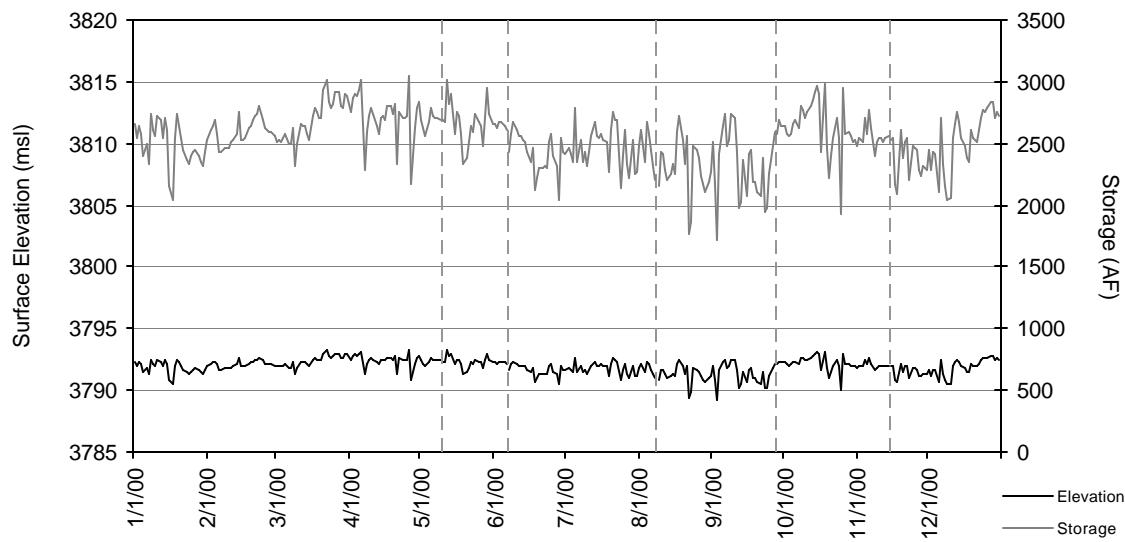


Figure S-1 JC Boyle Reservoir daily stage and volume

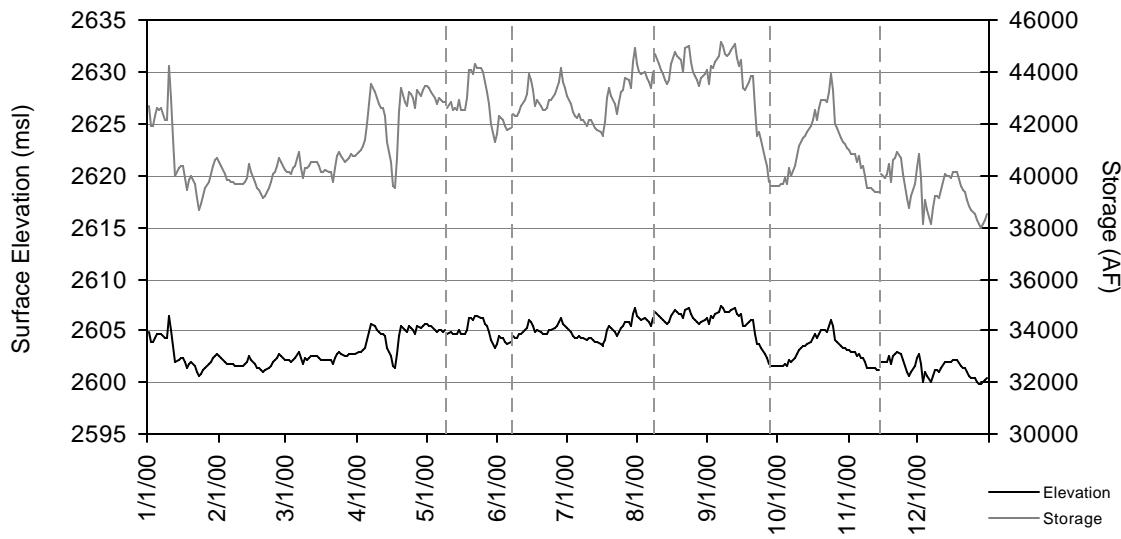


Figure S-2 Copco No. 1 Reservoir daily stage and volume

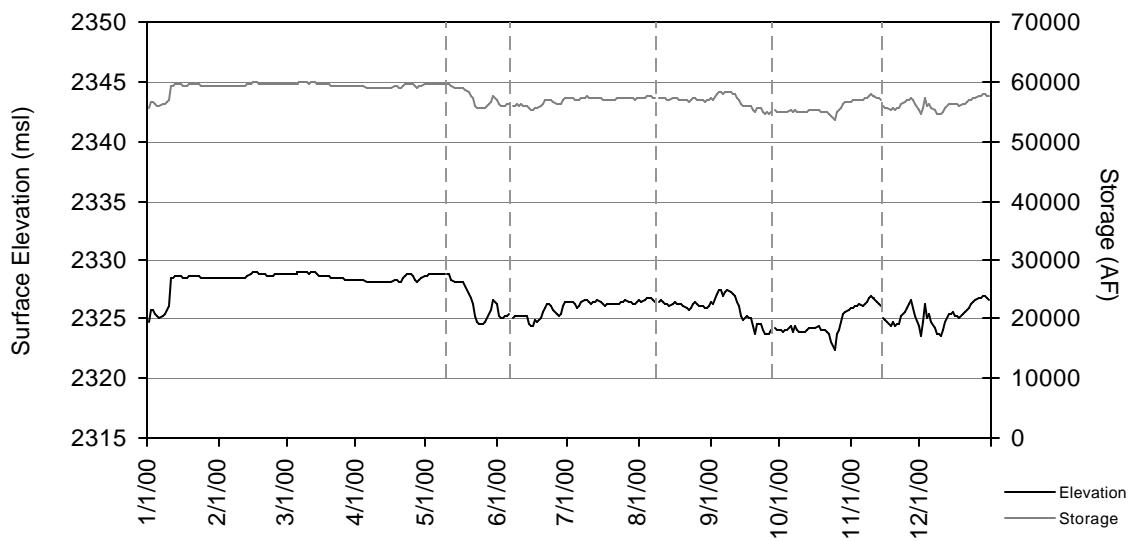


Figure S-3 Iron Gate Reservoir daily stage and volume

T METEOROLOGICAL DATA

Because conditions change spatially throughout the basin due to elevation, orographic features, and other local effects, meteorological data for two locations are presented: Klamath Falls, Oregon, and Brazie Ranch, California, which is near Yreka. These two stations are used to represent two portions of the project study area. The Klamath Falls station is assumed to represent conditions in the USBR project study area as well as Lake Ewauna and the Klamath River down to JC Boyle Reservoir. The Brazie Ranch station is presumed to approximately represent conditions in the middle Klamath River from Iron Gate Reservoir to Seiad Valley. No complete meteorological stations were available in the lower Klamath River. There are obvious limitations to the extrapolation of data from one location to another, and certain locations are not well represented by either of these two locations. Nonetheless, the meteorological conditions provide useful information for interpreting water quality data.

The Klamath Falls station is maintained by the U.S. Bureau of reclamation and is part of a satellite-based network (The Pacific Northwest Cooperative Agricultural Weather Network) of automated agricultural weather stations. The stations are located in irrigated agricultural areas throughout the Pacific Northwest and are dedicated to regional crop water use management and research. The data listed below are from the Klamath Falls, Oregon Station (KFLO), elevation 4100 feet, latitude $42^{\circ} 09' 53''$ and longitude $42^{\circ} 09' 53''$. The May-December 2000 mean, maximum, and minimum air temperature, and relative humidity, dew point temperature, wind speed, and solar radiation are presented in Figure T-1 to Figure T-5, respectively.

The Brazie Ranch station is maintained by the California Department of Forestry as part of their RAWS (remote automatic weather station) program. The station (BZR) is located at elevation 3020 feet, latitude 41.6870° and longitude 122.6000° . The May-December 2000 mean, maximum, and minimum air temperature, wind speed, and relative humidity are presented in Figure T-6 to Figure T-8, respectively. The meteorological station at Brazie Ranch experienced several periods where data were not collected. Dew point is not reported at Brazie Ranch, and solar radiation was not collected previous to September 2000 and is not presented. Data at Brazie Ranch are not corrected for daylight savings time. All sampling days are depicted by a vertical dashed line in each figure.

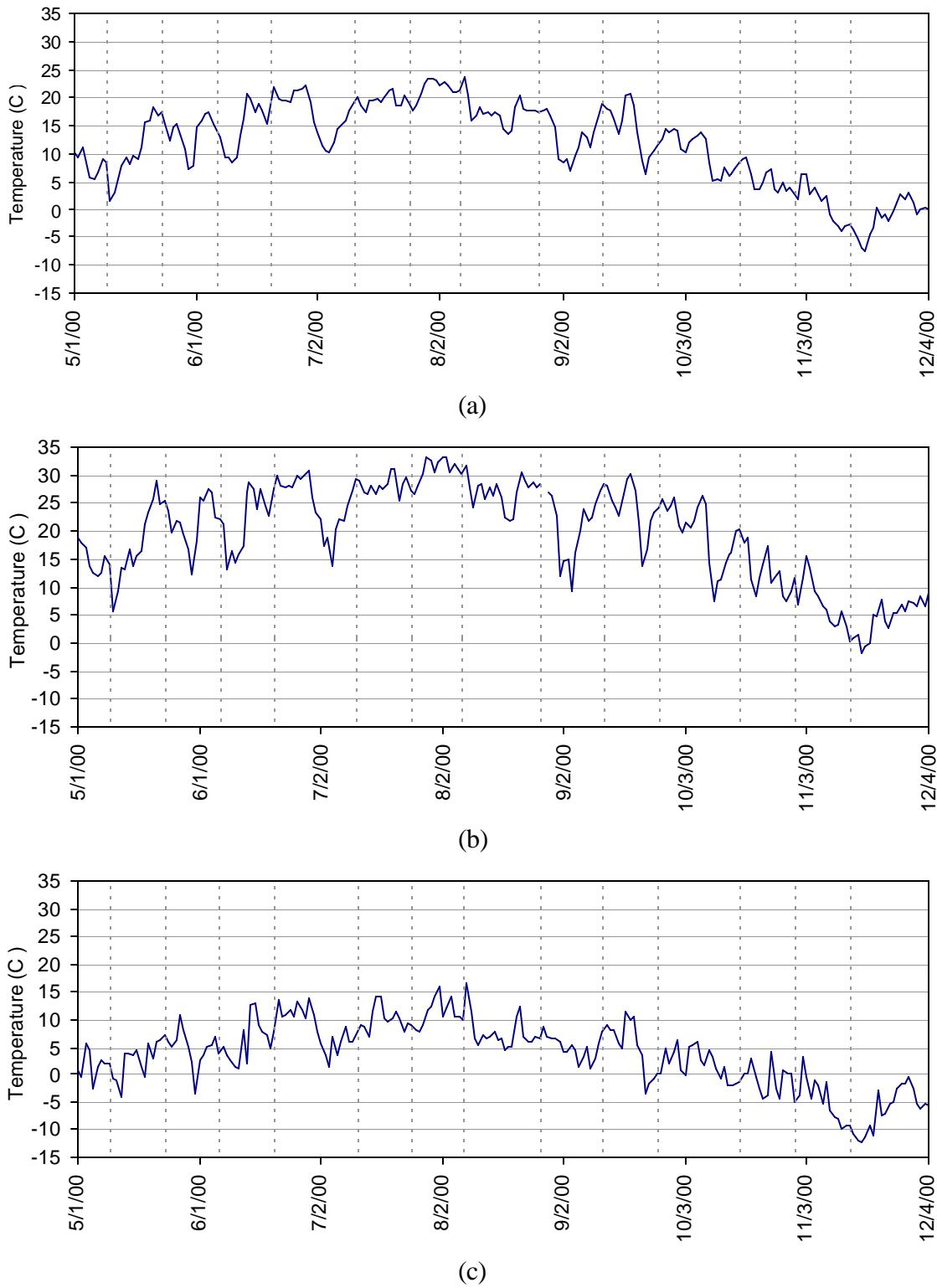


Figure T-1 Daily air temperature at Klamath Falls Oregon (KFLO), (a) mean, (b) maximum, (c) minimum (sampling dates shown with dashed lines)

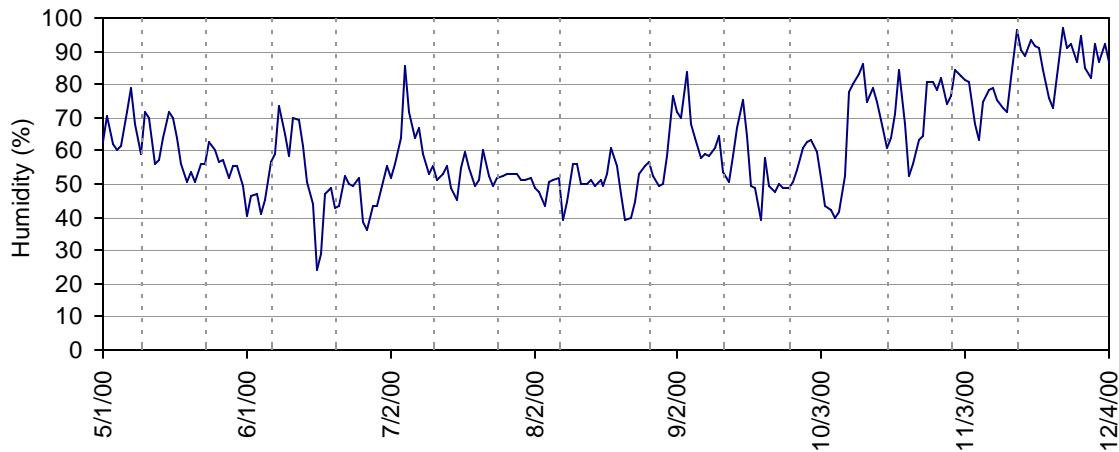


Figure T-2 Daily relative humidity at Klamath Falls Oregon (KFLO)

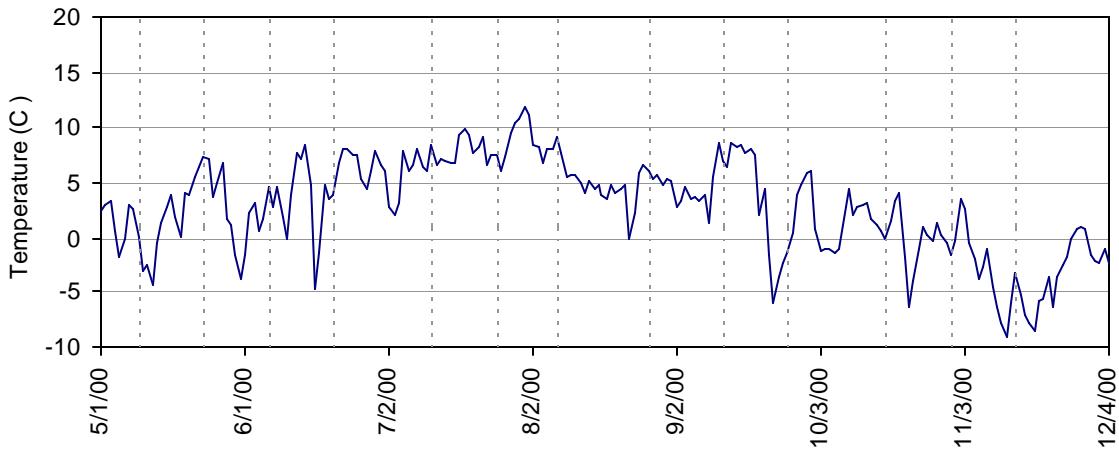


Figure T-3 Daily dew point temperature at Klamath Falls Oregon (KFLO)

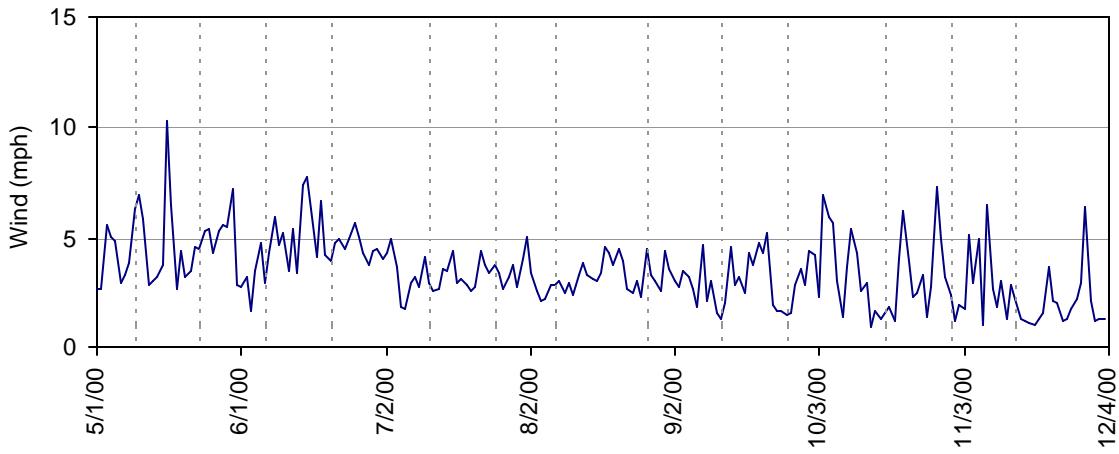


Figure T-4 Daily wind speed at Klamath Falls Oregon (KFLO)

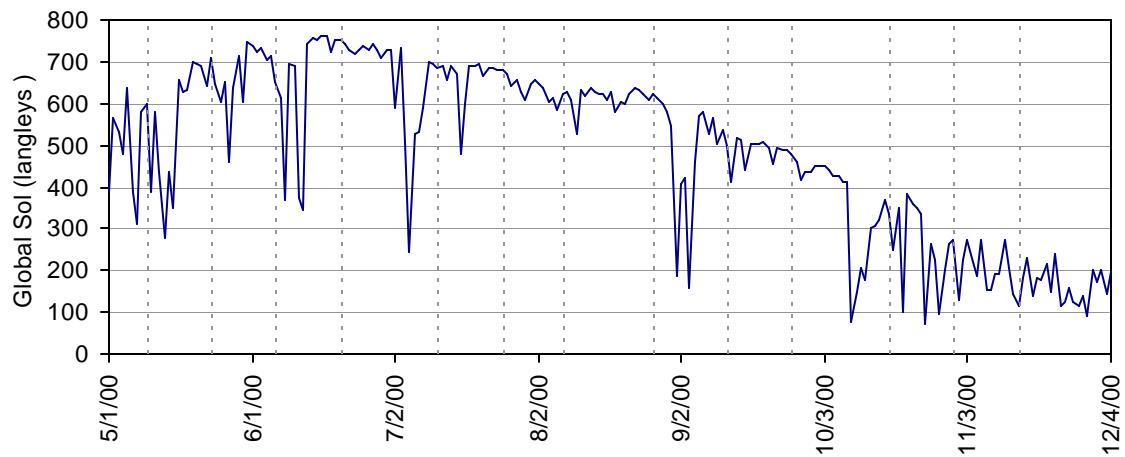


Figure T-5 Daily solar radiation at Klamath Falls Oregon (KFLO)

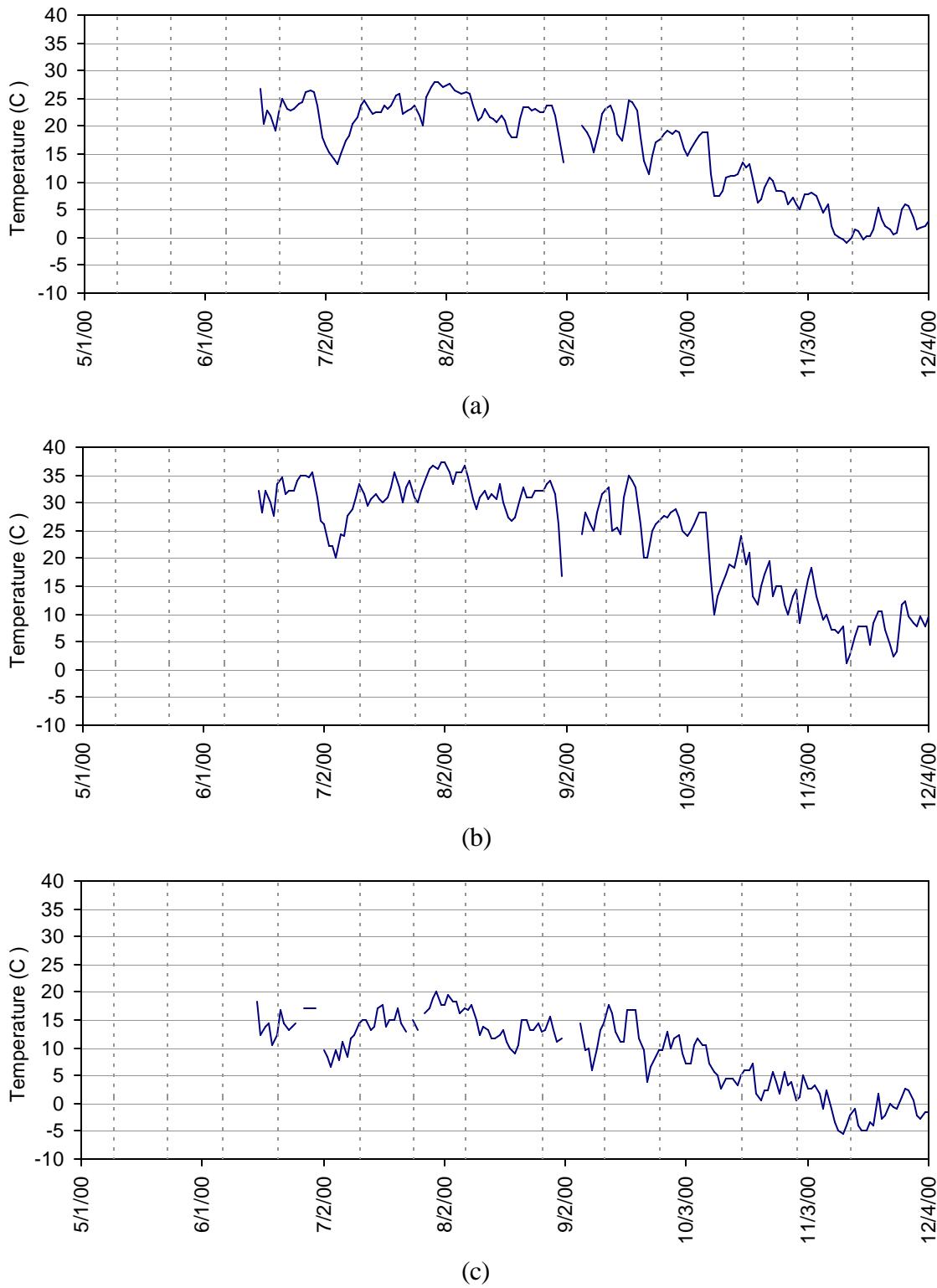


Figure T-6 Daily air temperature at Brazie Ranch (BRZ), (a) mean, (b) maximum, and (c) minimum

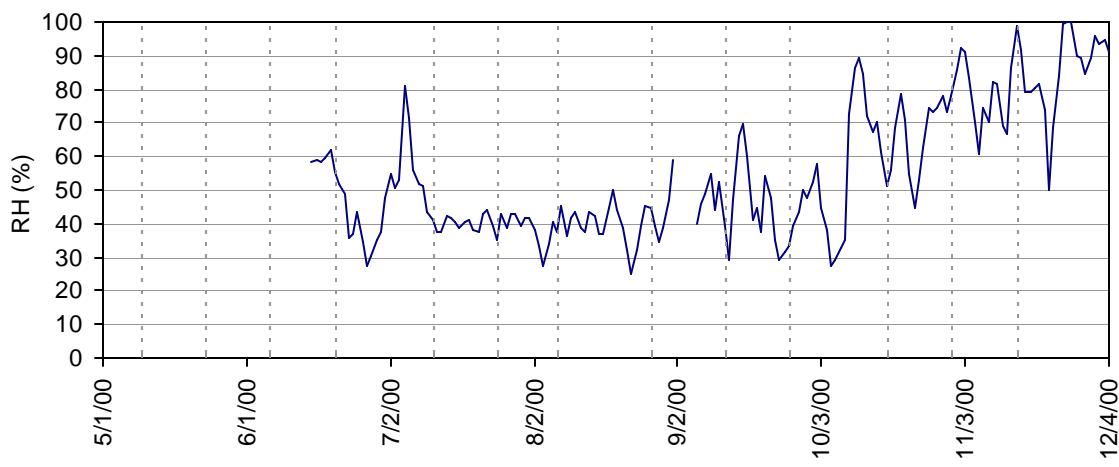


Figure T-7 Daily mean relative humidity at Brazie Ranch (BRZ)

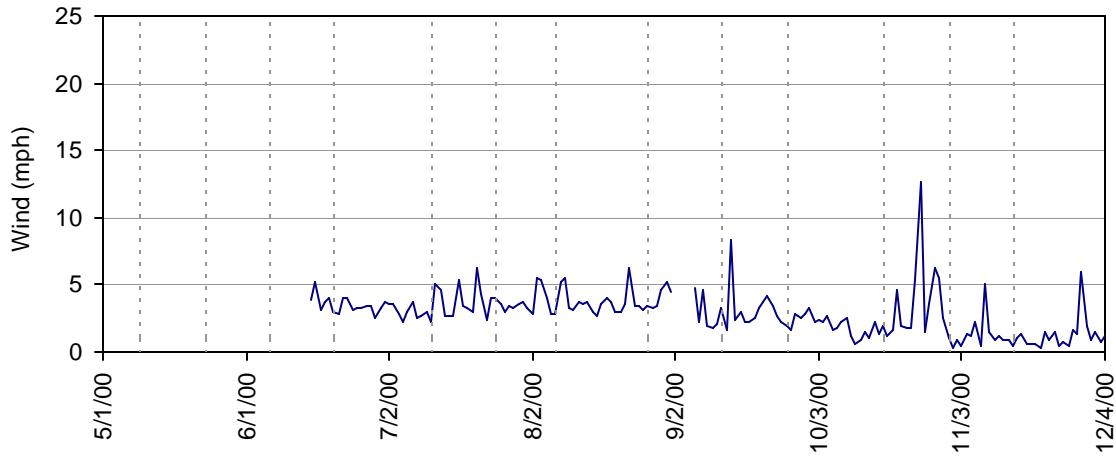


Figure T-8 Daily mean wind speed at Brazie Ranch (BRZ)

U DATASONDE POPULATION TESTING

“After I purchased my first watch I knew exactly what time it was; since I received a second one as a gift, I haven’t a clue.” Anonymous

The water quality probes used in this project included Hydrolab Datasonde III as well as the H-20 models. The Datasondes were used for remote deployment in the study area, while the H-20 units were used to collect physical parameter information during grab sampling. Scientists, field technicians, resource managers, and others who have used multiple water quality probes in field studies have noted that, although the units theoretically should produce coincident results, it is not uncommon to find two or more probes that record different parameter values when sampling the same water - differences that are in excess of factory specification. Most likely, the differences occur due to improper calibration, probe drift, probe malfunction, instrument mishandling, improper membrane, not letting a membrane mature, hardware, and/or age. Regardless of the cause, the fact that when immersed in a common body of water observations among probes can differ in excess of factory specifications.

Building on past experience, the protocol for probe deployment in the Klamath basin was changed in two fundamental ways. First, each sampling site was assigned two probes. These probes would be exchanged on a weekly basis and would only be used at that site. Second, all probes would be tested in a common body of water to ascertain differences, providing information, to the degree possible, for post correction of the data. Other minor changes in protocol included cleaning the probes more completely and formulating a deployment protocol

The impetus behind the simultaneous testing of Datasondes was not only to compare units directly, but to ascertain a “population” accuracy for the entire assemblage of units (Datasondes and H-20 units). Because no known standard was available to test each unit, the mean value for the entire population was assumed representative of actual water quality conditions.

U.1.1 Experimental Method

Hydrolab Calibration

The “Hydrolab Datasonde 3 and H20 calibration protocol” was followed for the calibration of the units. The units were calibrated at the Bureau of Reclamation Klamath Basin Area Office. Similar setup was used for both the Spring and Fall testing.

Specific conductance was calibrated with a 300 $\mu\text{s}/\text{cm}$ standard and a specific conductance linearity check was completed with a 147 $\mu\text{s}/\text{cm}$ standard. The pH was calibrated using pH 7 and pH 10 standards. The dissolved oxygen sensors with standard dissolved oxygen membranes were calibrated using the method outlined in the “Hydrolab Datasonde 3 and H20 calibration protocol”. The dissolved oxygen sensors with Lo-Flow dissolved oxygen membranes were calibrated using the method outlined in the Hydrolab Datasonde 3 operating manual. Units placed in the tub with Lo-Flow membranes are units that were deployed with Lo-Flow membranes in the field.

Set-up

The tub utilized for the December 20, 2000 measures 30"x 30"x 24" and is made of high-density polyethylene. The bottom of the tub was insulated from the floor with two "Rubbermaid Rough-Tote" container lids. The "Rubbermaid Rough-Tote" container lids are ~2" thick and are constructed of two layers of plastic with air between.

A 20-slot aluminum map rack supported the Hydrolab units in a vertical position. The aluminum map rack measures 21"x 16"x 25" (LxWxH). Hydrolab units not supported directly by the rack were attached to the rack with loops of wire (see photos). Units that were supported by wire loops were spaced the same distance apart as the units directly supported by the map rack.

Two 12-volt 500 GPH bilge pumps were used to circulate the water in the tub. One pump was placed in the northwest corner and the other was placed in the southeast corner of the tub. A one foot curved hose was attached to the output of each pump, which created a swirling flow within the tub.

All Hydrolab Datasonde 3 and Hydrolab Recorder units were fitted with weighted sensor guards immediately prior to placement in the tub. Stirrer/sensor guards were used for the Hydrolab H20 units. The stirrers on the H20 units were operated during the course of the tub test.

The tub was filled and both pumps were allowed to run for at least 30 minutes prior to the submersion of any units. The first unit was submerged at ~10:41 am. The addition of Hydrolab units continued until the last unit was submerged at ~11:15 am.

Once all of the units were in the tub, photos were taken and the lid was put in place. The lid to the tub didn't fit snug. There was a 3" gap at the northwest corner because the cables on the H20 units extended beyond the top of the tub. Two 5'x 8' insulating blankets (hazardous materials absorbent sheets) were folded in half and placed on the lid of the tub with the excess of the blanket draped over the sides of the tub.

Problems/Difficulties

One of the problems encountered while conducting the tub test was the loose fit of the lid on the tub. The cables to the H20 units extended beyond the top of the tub and prevented a snug fit of the lid. There was a gap ~3" at the northwest corner of the tub. The southeast corner of the lid fit snug on the top of the tub. Another problem encountered was one of the H20 units experienced an internal battery failure which caused the unit to shut down. An external battery was connected and the operation of the unit was restored.

U.1.2 Data Processing

The probes were tested in the spring prior to initial deployment and in the fall upon completion of the monitoring season. The method of processing the data was the same for each test. Differences between the spring and fall test are noted.

It was assumed that constant water temperature represented steady-state conditions. Review of the data for the other examined constituents (dissolved oxygen, pH, and specific conductance) supported this assumption. For the spring test, probes recorded information every 30 seconds and a fifteen-minute steady-state period was identified for analysis. For the fall test, probes recorded information at one-minute intervals and a thirty-minute period steady-state period was identified for analysis. In each case there were 30 samples. Twenty-seven probes (with two failures) were tested in the spring and twenty-four in the fall testing.

The average and standard deviation for each parameter for each probe were calculated using data from the identified steady state period. Subsequently, the population means, maximums, minimums, and standard deviations of all the probes for each parameter were calculated using the individual probe averages. Tables 1 and 2 summarize the average values for temperature, dissolved oxygen, pH, and specific conductance time series during the steady-state period for the spring and fall test, respectively. The statistics at the bottom of each table represent the population mean, maximum, minimum, and standard deviation. These data were plotted as well (see below).

U.1.3 Findings

A comparison of the spring and fall tests was done by comparing the population standard deviations for each parameter for the two tests. Table 3 illustrates that the standard deviations are comparable. Presuming the data are normally distributed, 95 percent of the data should fall within plus or minus two standard deviations from the mean. Using the average of the spring and fall test, 95% of the recorded probe temperatures fall within $\pm 0.23^{\circ}\text{C}$ of the mean (assumed “true” value), pH falls within ± 0.32 of the mean, specific conductance falls within $\pm 11.77 \text{ mS/cm}$, and dissolved oxygen falls within $\pm 0.72 \text{ mg/l}$ of the mean. These ranges are not to be confused with confidence intervals, but rather illustrate the variance among the samples (probes). Note, in the fall test, one temperature probe malfunctioned and was dropped from the statistical analysis (unit number 12)

Figure U-1 through Figure U-8 present the findings of the test for both the spring and fall tests. Error bars associated with the mean value for each probe value represent \pm two standard deviations ($\pm 2\text{SD}$). The bold solid line is the population mean, and the dashed lines represent uncertainty associated with the individual data points (depicted by error bars) \pm two standard deviations from the population mean. The error bars on the individual data points represent plus or minus two standard deviations based on the time series data (i.e., during the selected steady state period).

The temperature and specific conductance probes perform well and are generally within factory specifications. However, dissolved oxygen and pH did not fair as well. While the factory specifications on DO are $\pm 0.1 \text{ mg/l}$, the population varies (as defined by $\pm 2\text{SD}$) on the order of 0.7 mg/l . Factory specifications for pH are ± 0.1 unit and probes regularly reported values which deviated from the mean by greater than this value. These results are consistent with the findings of fled deployment of Datasonde probes. Namely, temperature and specific conductance perform well, while dissolved oxygen and pH

present data that is often inconsistent among probes – even those deployed at the same location.

U.1.4 Summary

Water quality probes are valuable instruments used in collection of certain water quality parameters. However, individual probes, for one or more of several reasons including

- human error (reading, calibration, post calibration corrections)
- calibration standards (incorrect, aged)
- deployment conditions (including testing apparatus)
- probe failure (age, malfunction, factory calibration)

As a result, the probes do not consistently report constituent concentrations when sampling a common water body. To overcome some of the limitations encountered when monitoring with multiple instruments a test of all probes simultaneously was conducted. The population means for temperature and specific conductance were consistent with factory specifications for all instruments; however dissolved oxygen and pH vary from factory specifications.

These results provide increased confidence in the use of data collected using this set of water quality probes. The tests also indicated that probes report values outside the range of their factory specified values, even when well maintained and properly operated. This variability should be incorporated into interpretation and application of all Datasonde data collected with these probes.

U.1.5 Future Work/Recommendations

The population test proved to be valuable in identifying probes that were not functioning properly, as well as the variability among the various probes. Further, although extensive measures were undertaken to ensure the probe test was carried carefully and under “steady state” conditions, there were difficulties encountered. Some of the key issues to consider in future tests include:

- Hydrolab (Datasonde) units should be calibrated using the same containers of calibration standards to avoid introducing error due to inconsistencies in different batches of calibration standards.
- individuals performing calibrations should use the same batch of de-ionized water. Different batches of DI water may have different concentrations of impurities. To avoid any discrepancies in calibrations due to differing quality of rinse water, all calibrations should be completed using the same rinse water.
- Hydrolab calibrations should be performed in similar environmental (office) conditions. All locations where calibrations are conducted should have similar wind current, air temperatures, etc.
- Hydrolab units should be calibrated the same day of the tub test. Units were calibrated over a two-day period for the fall test.
- longer “steady-state” periods (e.g. hour) leading to a larger sample for analysis may be desirable.
- improved control of environmental conditions (e.g., insulation, minimal disturbance, sufficient in tank mixing, etc.)

- specific tests over a range of conditions (e.g., multiple water temperatures, pH values, specific conductance)
- more complete statistical analysis

The tests are time and resource intensive, as are the data analyses. The tests carried out under this project were deemed sufficient to fulfill the objectives identified above in an economical manner.

Table U-1 Datasonde water quality probe test summary – spring 2000

Probe Information		Temp (°C)	pH	SC (µS/cm)	DO (mg/L) (mg/l)
Probe #	Serial #				
1	tt36818	11.93	8.27	303.17	5.51
2	tt10797	12.14	8.14	315.70	4.67
3	tt12018	failed			
4	tt12084	12.23	8.27	311.60	5.18
5	tt12086	12.18	8.14	317.97	4.77
6	tt14352	12.02	8.15	306.07	5.66
7	tt14353	12.05	7.90	311.03	5.25
8	tt14507	11.92	8.03	296.00	4.58
11	tt14667	12.05	8.67	315.03	5.48
12	tt14825	failed			
13	tt14886	12.11	8.23	308.23	5.27
16	tt14889	12.06	7.97	319.17	4.54
17	tt14909	12.16	7.71	311.00	5.39
19	tt14911	12.05	8.35	307.63	4.93
20	tt14912	12.10	8.24	315.47	5.20
21	tt14913	12.06	8.22	305.37	5.07
22	tt14914	12.08	8.00	317.67	4.86
23	tt14915	11.95	8.22	312.80	4.96
24	tt14916	12.10	8.20	314.00	5.17
25	tt15809	11.90	8.15	301.00	5.00
26	tt15817	12.04	8.27	308.00	5.09
28	tt18396	11.91	8.14	311.03	4.69
29	tt18397	11.89	7.90	310.60	5.17
30	tt18398	11.85	7.78	320.00	4.79
31	tt23363	11.89	8.14	320.00	4.80
34	tt36817	11.91	8.15	320.80	5.06
35	tt36818	<u>11.93</u>	<u>8.27</u>	<u>303.17</u>	<u>5.51</u>
	Mean	12.02	8.14	311.30	5.06
	max	12.23	8.67	320.80	5.66
	min	11.85	7.71	296.00	4.54
	stdev	0.10	0.19	6.51	0.31

Table U-2 Datasonde water quality probe test summary – spring 2000

Probe Information		Temp (°C)	Temp (°C)	pH	SC (µS/cm)	DO (mg/l)
Probe #	Serial #					
1	TT12018	20.58	20.58	7.68	140.12	6.48
2	TT12084	20.52	20.52	7.57	146.90	6.57
3	TT12086	20.85	20.85	7.62	149.51	6.59
4	TT14352	20.46	20.46	7.58	150.00	6.90
5	TT14353	20.71	20.71	7.52	139.31	6.51
6	TT14508	20.80	20.80	7.77	148.97	6.37
7	TT14666	20.80	20.80	7.66	148.94	6.78
8	TT14667	20.55	20.55	7.63	146.94	6.51
9	TT14887	20.47	20.47	7.62	150.00	6.54
10	TT14888	20.82	20.82	7.71	151.65	6.30
11	TT14889	20.69	20.69	7.61	150.35	6.11
12	TT14910	17.74		7.59	137.68	7.14
13	TT14911	20.70	20.70	7.55	152.00	7.21
14	TT14912	20.51	20.51	7.71	158.74	6.50
15	TT14913	20.75	20.75	7.61	148.00	6.12
16	TT15809	20.61	20.61	7.46	152.26	6.46
17	TT15818	20.44	20.44	7.65	150.00	6.46
18	TT23363	20.59	20.59	7.59	148.53	6.41
19	TT23365	20.65	20.65	7.41	150.97	7.34
20	TT14665	20.76	20.76	7.54	150.97	5.75
21	TT23120	20.62	20.62	7.56	149.00	6.21
22	TT23364	20.65	20.65	7.69	149.55	7.27
23	TT12080	20.83	20.83	7.41	156.06	7.14
24	TT37519	<u>20.73</u>	<u>20.73</u>	<u>7.10</u>	<u>150.97</u>	<u>7.06</u>
	Mean	20.53	20.66	7.59	149.06	6.61
	max	20.85	20.85	7.77	158.74	7.34
	min	17.74	20.44	7.10	137.68	5.75
	stdev	0.61	0.13	0.13	4.66	0.41

Table U-3 Comparison of standard deviation for the spring and fall population test

		Temp (°C)	pH	SC (µS/cm)	DO (mg/l)
Spring Test	+/- 1 stdev	0.13	0.13	4.66	0.41
Fall Test	+/- 1 stdev	0.10	0.19	6.51	0.31
Spring Test	+/- 2 stdev	0.26	0.26	9.32	0.82
Fall Test	+/- 2 stdev	0.20	0.38	13.02	0.62
	Avg. of +/- 2 stdev	0.23	0.32	11.17	0.72

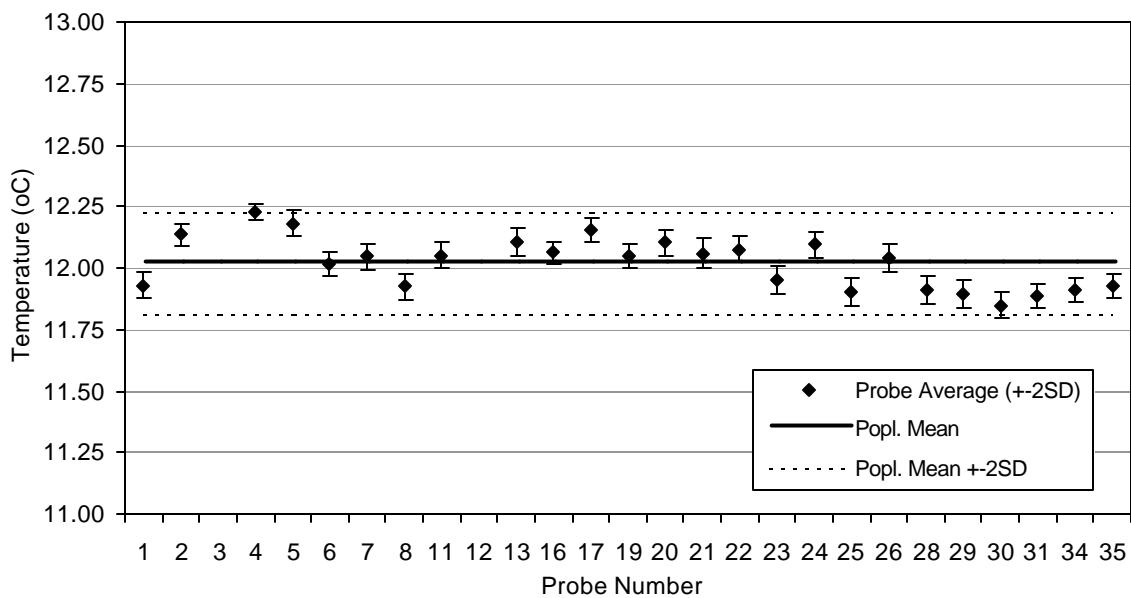


Figure U-1 Datasonde temperature probe population test results – Spring 2000

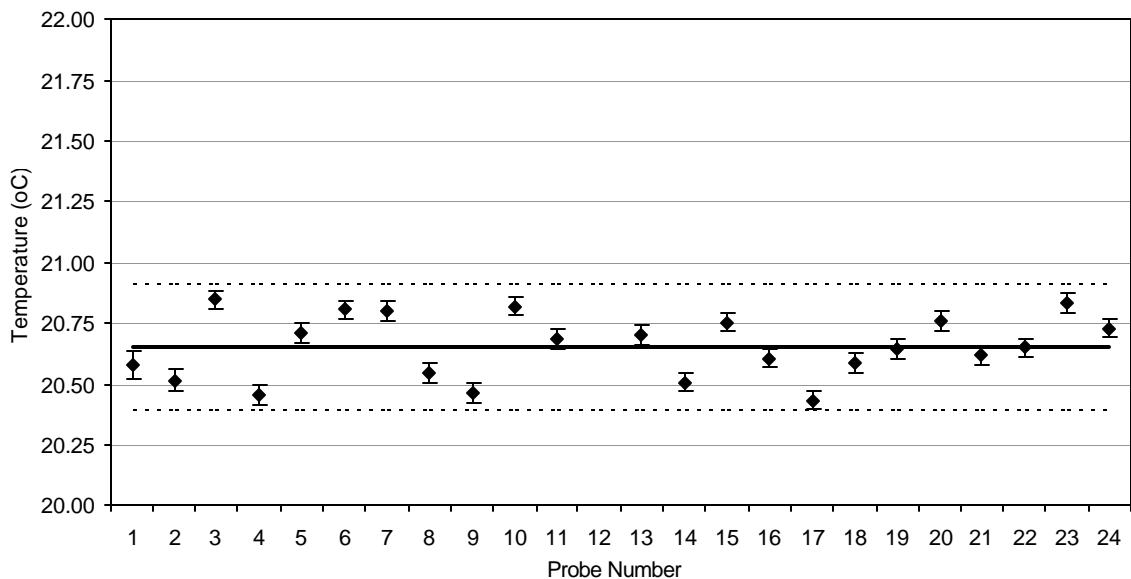


Figure U-2 Datasonde temperature probe population test results – Fall 2000

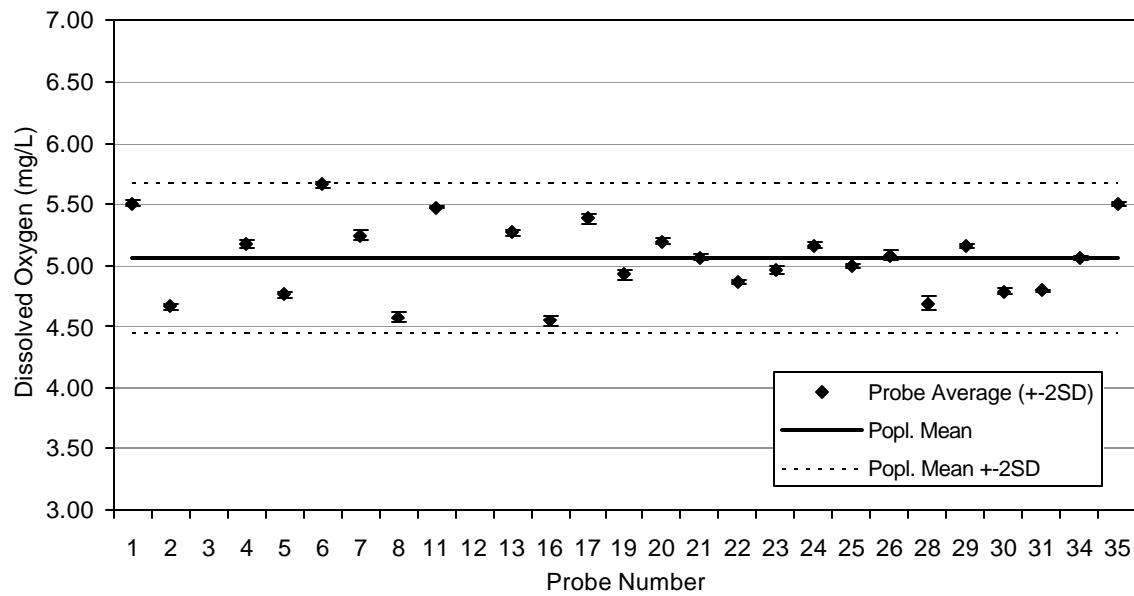


Figure U-3 Datasonde dissolved oxygen probe population test results – Spring 2000

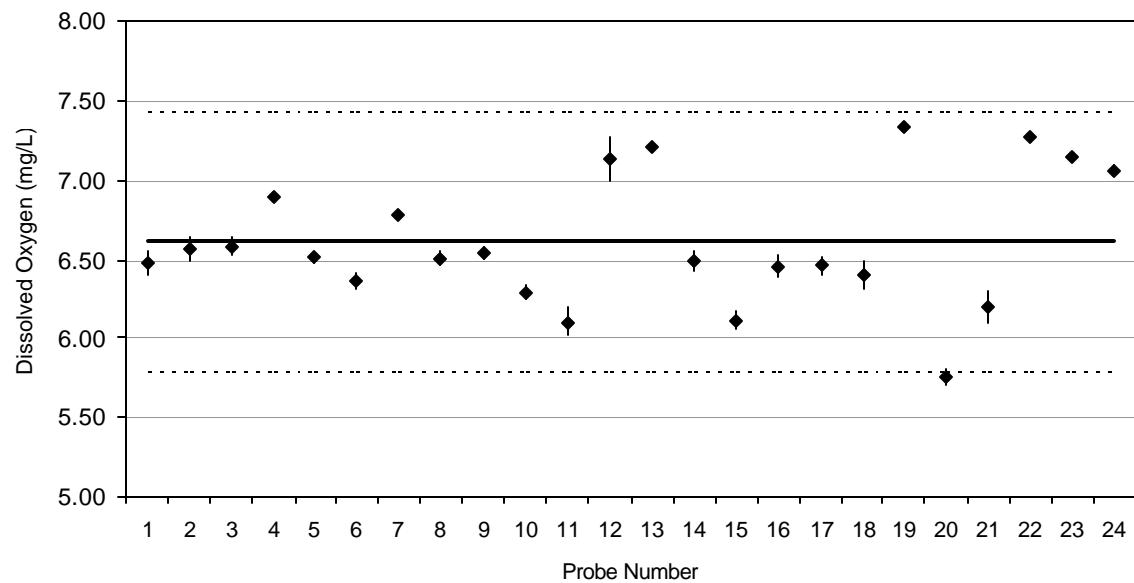


Figure U-4 Datasonde dissolved oxygen probe population test results – Fall 2000

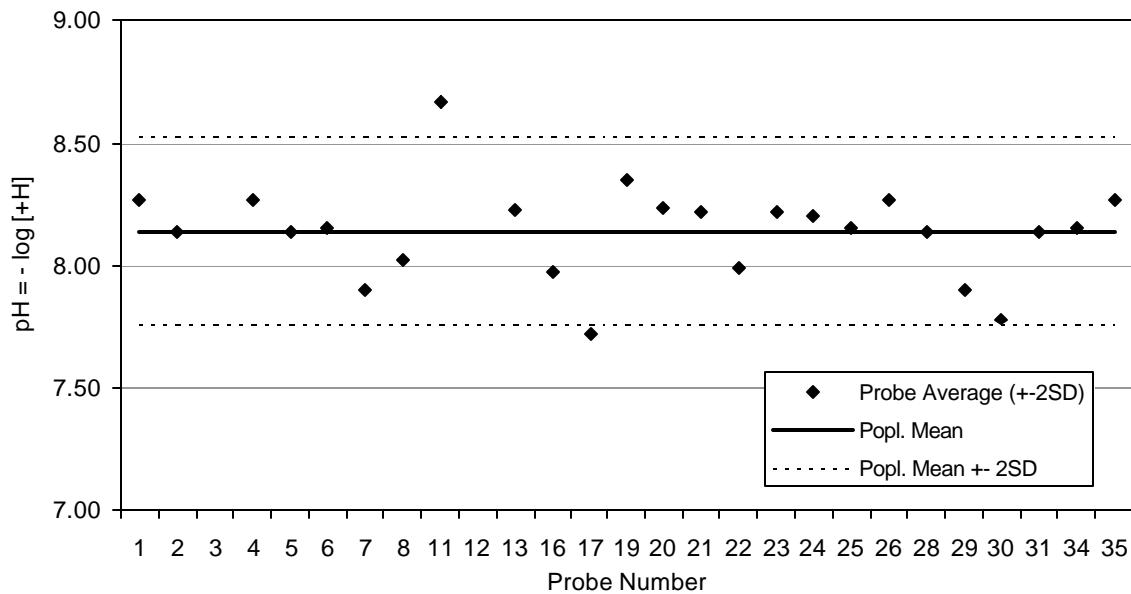


Figure U-5 Datasonde pH probe population test results – Spring 2000

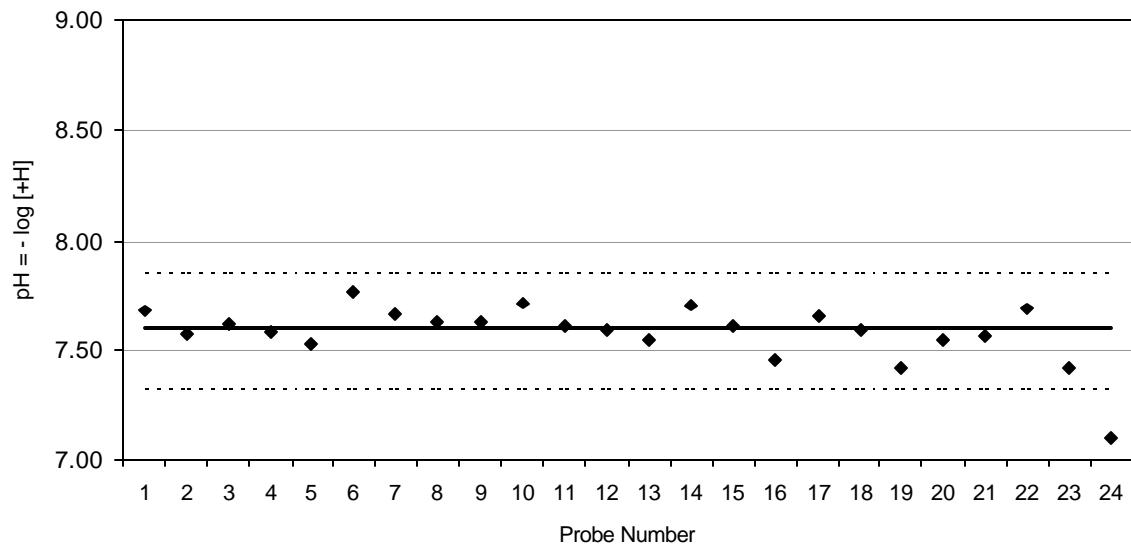


Figure U-6 Datasonde pH probe population test results – Fall 2000

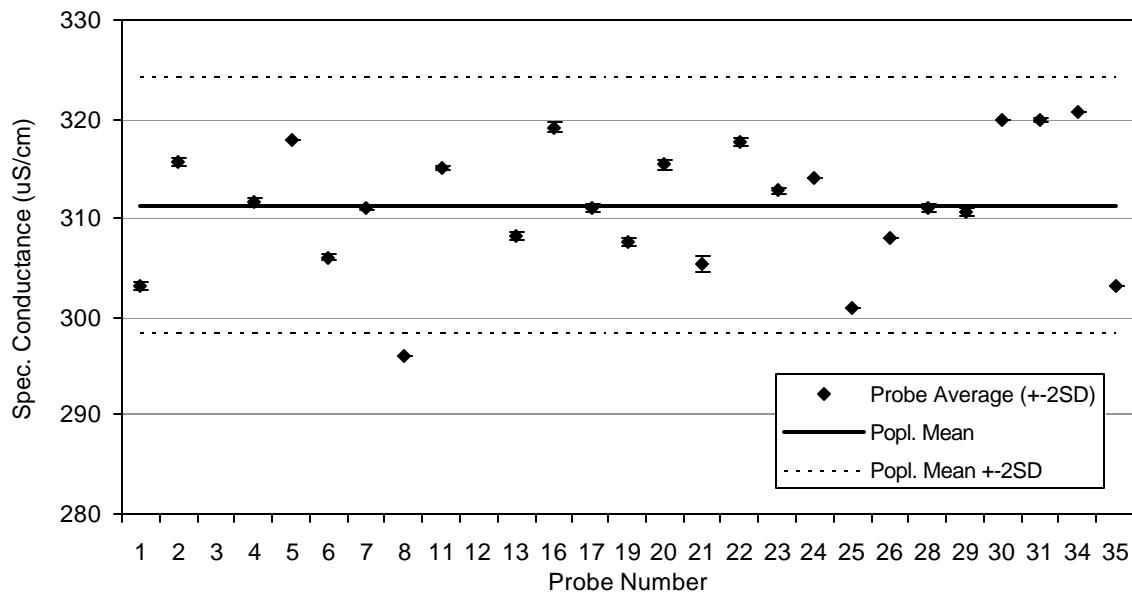


Figure U-7 Datasonde specific conductance probe population test results – Spring 2000

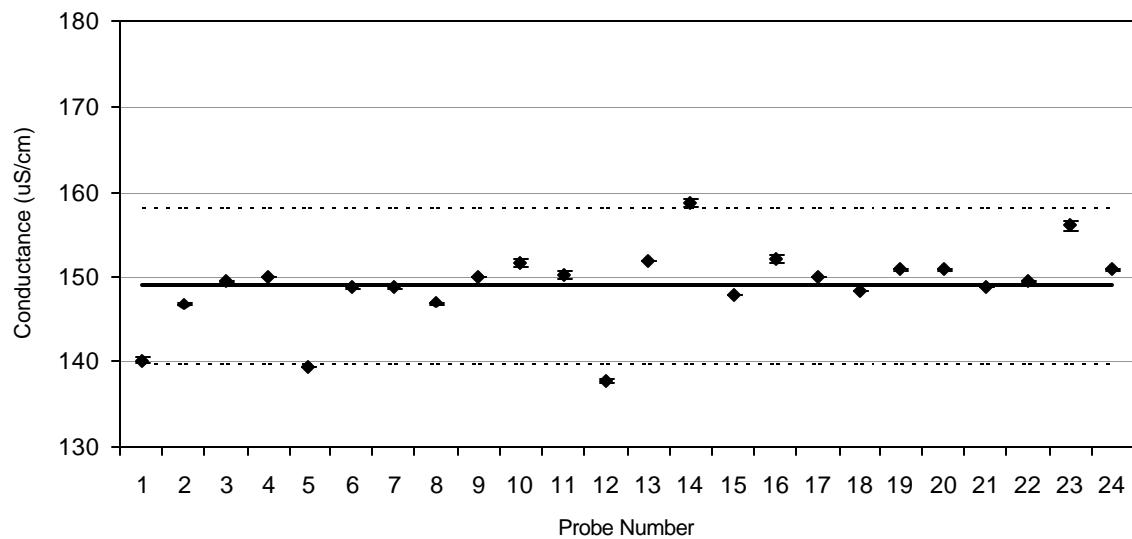


Figure U-8 Datasonde specific conductance probe population test results – Fall 2000